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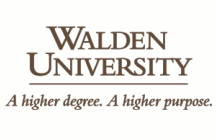

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Stroke Risk Factor Knowledge, Attitude, Prevention Practices, and Stroke

Adaku Ngozika Madubuko
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Walden University
2018

Abstract

Stroke Risk Factor Knowledge, Attitude, Prevention Practices, and Stroke

by

Adaku Ngozika Madubuko

MSN, Loyola University Chicago, 2004

BS, Indiana Wesleyan University, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2018

Abstract

Regardless of the advances that have been made in stroke research and treatment and the overall decrease in stroke mortality, the stroke mortality rate for African Americans is still high at 45.2/100,000 and is still the leading cause of adult disability. Knowledge of the risk factors of stroke is paramount to reducing the morbidity and mortality of stroke, but knowledge of stroke risk factors has been found to be suboptimal in the African American population. The purpose of this study was to examine if there is a relationship between the knowledge, perception, and sources of stroke information of risk factors for stroke. The theoretical framework for this study was knowledge, attitude, and practice model and the health belief model. A cross-sectional quantitative approach was used for this study, and data was obtained through in-person administration of a questionnaire to willing participants in two South District Cook County, Illinois, health centers, two churches, a barber shop, and a beauty shop. A total of 273 respondents that consisted of 42% men (n = 113) and 58% women (n = 160) provided valid responses. Chi-Square test of association showed a statistical significance between source of stroke information and previous stroke/transient ischemic attack at χ^2 (1) = 29.133, p = 0.001. Multiple regression analysis model showed a statistically significant result of perception and stroke, F (14, 259) = 22.692, $p < 0.0005$. This study found that stroke education should go beyond traditional medical risk factors to also explore people's perception of preventive practices. This study will contribute to social change by providing support for targeted stroke education not only on knowledge but also perception of preventive practices in the African American population.

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Dedication

This work is dedicated to my beloved father Samuel O. Madubuko who did not live to see his little girl attain this academic height. I will also like to include my mother Violet E. Madubuko who suffered a stroke just as I was beginning this journey

Acknowledgments

Very special thanks to my dissertation Chair Dr. Alexander Nicoletta for her support, guidance and encouragement. This journey would not have started without the support of my husband Enyinnaya L. Nwankwo who encouraged me to enroll in the program and remained supportive through this journey. Special thanks to my daughter Samantha Nneoma Madubuko for her support even though she could not understand why mummy has so much homework. Also, thanks to my only brother and sibling Nnaemeka A. Madubuko for his support through this journey. The ultimate thanks to GOD for HIS mercies, favor, blessings, and being the center of my life, upholding me without which this whole journey would not have started and ended; THANK YOU GOD.

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Chapter 1: Introduction to the Study

Introduction

Stroke is a debilitating condition with devastating consequences or outcomes. Stroke results when there is block or a break in the arteries supplying blood to the brain. Sacco et al.'s (2013) updated definition of stroke encompasses the clinical and tissue criteria irrespective of areas of focus, whether in practice, research, or public health assessments. Ischemic stroke is thus defined as "an episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction" (Sacco et al., 2013, p. 2072). Transient ischemic attack (TIA) is a brief episode of neurological dysfunction from focal brain ischemia without acute infarction (Sacco et al., 2013). Intracerebral hemorrhage (ICH) is a localized collection of blood in the brain parenchyma or ventricles while subarachnoid hemorrhage (SAH) is bleeding into the subarachnoid space (Sacco et al., 2013). Stroke is one of the leading causes of morbidity and mortality globally and lack of knowledge and poor risk factor control is contributing to its rise in incidence. In the African American population, the risk of stroke is 10 times higher than for Caucasians (Sallar, Williams, Omishakin, & Lloyd, 2010).

Knowledge is a vital concept in any prevention or risk reduction effort. However, knowledge alone cannot determine or change human behavior. For the purpose of this study, knowledge is conceptualized as awareness, gaining insight or information of a specific situation or disease process (Khalili & Abdairahim, 2014). In addition to knowledge, attitude towards what is known is equally important. Attitude is conceptualized as the reaction towards known predispositions (Bano, Alshammari,

Fatima, & Al-Shammari, 2013). Practice is conceptualized as the application of knowledge (Bano et al., 2013). Based on this background on knowledge, attitude, and practice, the relevance of these to aspects of this research is substantial. As a result of the development of knowledge, attitude, and practice proposed by this work, the exposure to information on stroke, understanding of the associated risk factors, and preventive skills displayed in the African American population of South District Cook County may significantly increase.

Background

In general, stroke is more prevalent in people 65 years and older (Sallar, et al., 2010), but in African Americans, the age at first stroke is much younger and the outcome poorer. The risk factors for stroke can be classified as modifiable and nonmodifiable (Goldstein et al., 2011). The nonmodifiable risk factors for stroke include age, race and ethnicity, and gender, while the modifiable risk factors include diabetes mellitus, high blood pressure, atrial fibrillation, cigarette smoking, excessive alcohol consumption, sleep disordered breathing, high cholesterol, physical inactivity, and overweight and obesity (Goldstein et al., 2011). Race/ethnicity plays a vital role in stroke occurrence with African Americans having the highest prevalence of stroke compared to other ethnic groups. This is as a result of the prevalence of stroke risk factors in this population (Go et al., 2013).

Knowledge of stroke risk factors is suboptimal in the African American population (Go et al., 2013). Some selected articles that relate to knowledge and perception of stroke risk factors and the stroke/TIA experience are as follows. In their

study, Alkadry, Bhandari, Wilson, & Blessett (2011) provided information on the disparities that exist between African Americans and Caucasians relating to knowledge gap of stroke risk factors. There were significant differences in recognizing certain stroke risk factors: elevated cholesterol, previous stroke, smoking, and race. Forty percent of African Americans perceived that they were at risk for stroke. Seventy nine percent of African Americans were aware that high cholesterol is a stroke risk factor as against 86% in Caucasians, 31.4% of African Americans were aware of the differences in stroke and gender, and 56% were aware of age and stroke as against 73.2% Caucasians. In a study conducted by Biederman et al. (2012), the focus was on ethnic and racial differences in regard to baseline stroke knowledge. In their study of baseline stroke knowledge in two North Carolina counties, they discovered that despite advances in treatment of acute stroke, there was a baseline global lack of knowledge of the risk factors of stroke. In the African American population of the study, only 43% correctly identified the brain as the area of the body affected in a stroke, 16% identified the head, 13.3% identified the heart as the organ affected by stroke, 13.5% did not know the organ, and another 13.6% choose other. Hypertension was identified by the 39.8% of African Americans as a top risk factor, 9% identified diabetes mellitus, and 8.2% did not know.

In the study by Sloma, Backlund, Strender, & Skånér (2010), knowledge of certain risk factors for stroke was still very low among individuals who had experienced stroke or TIA. In their questionnaire study of stroke and TIA survivors, they found that the knowledge of antiplatelet and diabetes mellitus as a stroke risk factor was low even in this population. Sallar et al. (2010) focused on individuals being able to identify stroke

risk factors and warning signs in their study. There was low knowledge of stroke risk factors in the African American population of this Mississippi delta region. Specifically, 52.7% could not identify lack of physical activity, 56.4% could not identify excessive alcohol consumption, 53.2% could not identify diabetes, 38.3% could not identify smoking, and 28.7% could not identify high cholesterol as stroke risk factors. However, the work by Weltermann, Driouach-Bleckmann, Reinders, Berndt, & Gesenhues (2013) discussed the lack of knowledge of stroke risk factors among diabetes in natives and migrants in Germany. Their cross-sectional questionnaire survey of 250 diabetic patients from Germany and Turkey in primary care and diabetes clinics was conducted to determine the patients' stroke knowledge showed no significant statistical difference between the groups; natives and migrants, with regards to gender, health insurance, and professional work status, but patients younger than 61 years had better stroke knowledge (Weltermann et al., 2013). Only one-third of African American as compared to Caucasians were aware of their atrial fibrillation status (OR=0.32; 95% CI: 0.20 to 0.52). (Turagam, Velagapudi, Visotcky, Szabo, & Kocheril, 2012). In their study, Biederman et al. (2012) also noted a suboptimal knowledge of the five stroke risk factors (high blood pressure, diabetes mellitus, smoking, overweight/obesity, and lack of exercise) in African Americans.

The ability of people to have knowledge on the risk factors of stroke, adopt a constructive attitude, and practice positive lifestyle modification is paramount to reducing the morbidity and mortality that accompanies this disorder. The findings of some of these studies suggest a lack of knowledge of the risk factors for stroke in the African American

population. There are, however, inconsistencies in the literature regarding the specific weaknesses in stroke knowledge and what the relationships are between knowledge of the risk factors, attitude about these risk factors, and current practices towards stroke prevention. This study contributes to the body of knowledge regarding helping awareness and understanding of stroke risk factors and reduction in incidence of stroke in populations that are most at risk. The study will also help direct practice on a more efficient stroke risk factor assessment and, in the long-term, may also assist in policy direction and health cost reduction.

Problem Statement

Approximately 800,000 Americans have a stroke each year in the United States (Sallar et al. 2010). Of these, 600,000 are first occurrence and 185,000 are recurrent (Sallar et al., 2010). Further, 150, 000 of these are fatal, which is 1 in every 19 deaths from all causes (Sallar et al., 2010). On the average, someone in the United States suffers a stroke every 40 seconds, and every 4 minutes, someone dies from a stroke (Centers for Disease Control and Prevention [CDC], 2014; Go et al., 2013). Despite the advances that have been made in stroke research and treatment and the overall decrease or reduction in stroke mortality, stroke continues to be the fourth leading cause of death nationally (Go et al., 2013), the third leading cause of death in the State of Illinois, and the third leading cause of death in Suburban Cook County (Illinois Department of Public Health [IDPH], 2013). By the year 2030, there will be an estimated addition of 3.4 million strokes (American Heart Association [AHA], 2014) to the 6.8 million people over or equal to 18

years who already have had a stroke in the United States (Go et al., 2013). This will represent an estimated 20.5 percent increase in prevalence from 2012 (AHA, 2014).

African Americans are disproportionately affected by stroke than their Caucasian counterparts (AHA, 2014). African Americans have twice the mortality from stroke and have more severe disabling stroke than their Caucasian counterparts (Go et al., 2013). In South Suburban Cook County, the stroke mortality rate for African Americans (87.1/100,000) was twice the rate for Caucasians (41.0/100,000) in 2005-2007 and 81% higher than the Healthy People 2010 goal of 48.0/100,000 according to Cook County Department of Public Health (CCDPH; 2011). Though the stroke mortality rate for South Cook County has decreased (45.2/100,000) and is below the Healthy People 2010 goal of 48.0/100,000, stroke is still the leading cause of adult disability (CCDPH, 2015).

Even though recent treatments have changed, especially in regard to reperfusion for certain strokes, effective primary prevention remains the best approach to forestall this illness, especially with 76% of strokes being first events (AHA, 2014). Eighty percent of stokes can be prevented by modifying certain risk factors (AHA, 2014). Stroke remains the leading cause of long term disability with estimated costs of $62.7 billion on combined stroke and disability expenditures (Go et al., 2013). The total cost of stroke from 2005 to 2050 is projected at $379 billion for African Americans. African Americans bear a huge brunt of the burden of stroke in comparison with other racial groups.

On review of literature, there were varying results from studies on the knowledge of risk factors. The number of strokes per annum has not changed despite advances in treatment. Eight hundred thousand Americans are still experiencing a stroke every year

(Go et al., 2013). The age at first stroke in African Americans is much younger than with other racial groups and the outcomes bleaker. Several studies that tried to address the problem were on a predominantly Caucasian population. Despite an increased interest in stroke treatment, it is surprising that there is no stroke risk factor specific tool, and based on a review of literature, there are limited published studies on African Americans and the risk factors of stroke peculiar to them or their knowledge, attitude and practice in regard to stroke risk factors. Rather, relevant recent publications on African American related stroke issues mostly center on the likes of (a) comparative studies on stroke risk factor awareness with other racial groups and ethnicities (Alkadri et al., 2011; Boden-Albala, Carman, Moran, Doyle & Paik 2011; Sallar et al., 2010; Travis et al., 2003), (b) incidence of stroke (Kleindofer et al., 2010), and (c) individual stroke risk factors knowledge (Aycock et al., 2015; Biederman et al., 2012; Bogoshi, Stewart, Hale, & Fritz, 2003;).

Purpose of the Study

The relationship between the knowledge, attitude, and practices towards stroke risk factor prevention in the African American community is not well researched. The purpose of this quantitative research study was to examine the relationship between the knowledge and attitude of the African American adults in South District Cook County and stroke prevention practices, and the relationship between knowledge, attitude, and practice and stroke perception. Furthermore, in this study I also sought to determine the relationship between perception of the risk for a stroke and stroke risk factor knowledge,

and the relationship of the knowledge of stroke risk factors and risk factor knowledge sources of information. As such the emphasis of the research related to

- the population's knowledge of the individual risk factors for stroke,
- dispositions to stroke and the stroke experience,
- perceptions of the risk for stroke, and
- attitude towards stroke risk factor knowledge.

This is especially important in order to determine the variables that drive the increased stroke experience in the African American population of South Suburban Cook County. The term stroke experience refers in this study to individuals who have had any of the three types of stroke described earlier: ischemia, TIA, and hemorrhages (ICH, SAH). The dependent variables for this study were stroke/stroke experience (including TIA, ischemia, and ICH and SAH), stroke prevention practices, and perception of the risk for a stroke. The independent variables were (a) knowledge of stroke risk factors, which include smoking, high blood pressure, atrial fibrillation, diabetes mellitus, family history, previous stroke/TIA, physical inactivity, carotid artery disease, elevated cholesterol levels, over weight/obesity, sleep apnea, and excessive alcohol consumption; (b) attitude towards the stroke risk factors; and (c) sources of stroke information.

Research Questions and Hypotheses

The research questions (RQs) and hypotheses were derived from the review of literature on stroke risk factor awareness or knowledge in the African American population. The overarching question that guided this study were why the incidence of stroke in this population is higher than the rest of the State of Illinois and the Healthy

People 2020 goal. To answer this question, I explored the nature of the relationship between the knowledge and attitude of the respondents' individual stroke risk factors and stroke prevention practices and their perception of stroke. I also explored whether or not the sources of stroke information in this population of African Americans in South District Cook County affects their knowledge of the stroke risk factors. The study employed a correlational research design using linear regression analysis. The instrument used for the measurement of these variables in this study allowed for regression analysis and the questions and hypothesis also reflected this type of analysis. The specific research questions were:

RQ1: Is there any significant association between knowledge of the stroke risk factors—hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County?

$H_0$1: There is no significant association between knowledge of the stroke risk factors— hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a

stroke) in the adult African American population of South District Cook County.

H_a1: There is a significant association between knowledge of the stroke risk factors— hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County.

RQ2: Is there any significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

H_02: There is no statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

H_a2: There is a statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

Theoretical/Conception Framework

The theoretical framework for this study was the knowledge, attitude and practice (KAP) model. The KAP model was developed by the World Health Organization to

address knowledge, attitude and practice. This model considers the complex relationship between the knowledge, attitude, and practice in health education and practice. The constructs of knowledge, attitude, and practice of this theory makes it easier to understand the issue of lack of knowledge of stroke risk factors, the respondents' attitudes, beliefs, or perception towards these risk factors, and the practices that are geared towards stroke risk factor reduction. Also, the health belief model (HBM) constructs of perceived susceptibility and perceived barriers were used in this study.

Nature of the Study

This study was a quantitative cross-sectional study. A quantitative study design was selected because it can provide empirical data on the magnitude of the lack of knowledge of stroke risk factors as the driving force behind increasing stroke risk in this population. Further, the study's results may provide additional support and further highlight the need for better preventive measures in the area of stroke awareness strategies.

The independent variables for this study were (a) hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke; (b) sources of stroke information; and (c) attitude towards stroke risk factors. Also, perception of stroke (notion or understanding of stroke) in patients with known risk factors and those without risk factor is another independent variable. The dependent

variables are stroke/stroke experience, TIA, hemorrhages (ICH, SAH), and stroke prevention practices. The main purpose of this study was to investigate the nature of the relationship between the knowledge and attitude towards risk factors for stroke and the stroke experience or stroke prevention practices. Also, in this study I examined the relationship between perception of the risk factors for stroke and stroke and stroke risk factor knowledge sources of information. The study sample was drawn from a convenience sampling of adult African American residents of South District Cook County. The analysis of the study was done with statistical package for social sciences (SPSS). Data was collected by use of the Stroke Risk Factor Knowledge and Perception Questionnaire (SRFKPQ), which was developed from a combination of reliable, validated stroke risk factor knowledge questionnaires: Stroke Knowledge Test (SKT), Stroke Awareness Questionnaire (SAQ), and Stroke Recognition Questionnaire (SRQ). Increasing numbers in the questionnaire were graded as limited knowledge while decreasing numbers were graded as significant knowledge.

Definitions

Independent Variables

Knowledge of high blood pressure: The awareness and ability to correctly identify high blood pressure as a risk factor for stroke. Hypertension is defined as a having a systolic blood pressure ≥ 140 mmhg and a diastolic blood pressure ≥ 90 mmhg (Chobanian et al., 2003).

Knowledge of atrial fibrillation: The awareness and ability to correctly identify atrial fibrillation as a risk factor for stroke. Atrial fibrillation is an irregular fast heartbeat (Fuster, Rydén, Cannom, Crijns, Curtis, Ellenbogen, 2011).

Knowledge of diabetes mellitus: The awareness and ability to correctly identify diabetes mellitus as a risk factor for stroke. Diabetes mellitus is a condition in which sugars build up in the blood leading to abnormally high levels (Siu, 2015).

Knowledge of excessive alcoholic consumption: The awareness and ability to correctly identify excessive alcoholic consumption as a risk factor for stroke. The Substance Abuse and Mental Health Services Administration (SAMHSA) defines heavy alcoholic consumption as taking five or more drinks on the same occasion on each of five or more days in the past 30 days. According to National Institute on Alcohol Abuse and Alcoholism, one "standard" drink contains roughly 14 grams of pure alcohol, which is found in any of the following:

- 12 ounces of regular beer, which is usually about 5% alcohol,
- 5 ounces of wine, which is typically about 12% alcohol, or
- 1.5 ounces of distilled spirits, which is about 40% alcohol.

However, Meschia et al. (2014) defined 1.5 fluid ounces of 80 proof spirits as one standard drink.

Knowledge of sleep apnea: The awareness and ability to correctly identify sleep apnea as a risk factor for stroke. Diagnosis of sleep apnea is based on the apnea-hypopnea index, which describes the number of respiratory events (cessations or reductions in air flow) observed during sleep. Sleep apnea is defined as present if the apnea-hypopnea

index is ≥ 5 events per hour, and an increasing apnea-hypopnea index indicates increasing severity. **(**Epstein et al., 2009).

Knowledge of physical inactivity: The awareness and ability to correctly identify physical inactivity as a risk factor for stroke. Physical Inactivity can be used to describe the people who do not meet the guidelines for aerobic physical activity of at least 150 minutes in a week of moderate physical activity or 75 minutes in a week of vigorous physical activity or an equivalent of the combination of the two (Healthy People 2020, 2018).

Knowledge of elevated blood cholesterol: The awareness and ability to correctly identify high blood cholesterol as a risk factor for stroke. Cholesterol is a fat-like substance in the body. There are good and bad cholesterol in the body. The higher the blood cholesterol number is, the higher the chances that it will clog off an artery and cause a stroke. Elevated blood cholesterol describes when the blood cholesterol number is high (National Heart Lung and Blood Institute [NLHBI], 2005).

Knowledge of overweight/obesity: The awareness and ability to correctly identify overweight/obesity as a risk factor for stroke. Overweight is body mass index (BMI) greater than or equal to 25.0 kg/m^2 and less than 30.0 kg/m^2. Obesity is BMI greater than or equal to 30.0 kg/m^2. Extremely obese is BMI greater than or equal to 40.0 kg/m^2.

Knowledge of increasing age or aging: The awareness and ability to correctly identify aging as a risk factor for stroke.

Knowledge of family history: The awareness and ability to correctly identify family history as a risk factor for stroke.

Knowledge of previous history of stroke: The awareness and ability to correctly identify previous stroke as a risk factor for stroke.

Knowledge of cigarette smoking: The awareness and ability to correctly identify cigarette smoking as a risk factor for stroke

Dependent Variables

Stroke experience: Experience of individuals who have had any of the three types of stroke described earlier: ischemia, TIA, or hemorrhages (ICH, SAH).

Transient ischemic attack: A condition where an individual feels numbness or tingling on one side of the face or body which lasts for a few minutes and goes away.

Ischemia: A stroke that presents with weakness of one side of the face or body or slurred speech which persists, and the individual comes into the hospital due to the deficits or lingering sign and symptoms. Self-reported history of an infarct (blood clot in the brain) and or diagnosis by the physician.

Hemorrhages (ICH, SAH): A stroke that presents with blinding headache and brings patient to the hospital and is brought on by a bleed in the head. Other signs and symptoms are weakness on one side of the body and self-reporting of physician diagnosis of a bleed into the brain.

Stroke perception: A person's feeling that they are prone to have a stroke in the near future.

Stroke prevention practices: A person's application of knowledge towards the determined action and in this case engaged in lifestyle activities to prevent a stroke:

increased physical activity, dietary modification, smoking cessation and alcohol consumption modification.

Assumptions

At the beginning of this research, a few key assumptions were made. In this study, it was assumed that first, that the instruments or tools of this research will be effective in collecting the information needed and in so doing assist in the proper identification of the lack of knowledge of specific stroke risk factors pertinent to this population. That should help make a more realistic recommendation about community educational approach and activities to address them. Second, it was assumed that the participants will be honest in reporting the answers to their knowledge of stroke risk factors. Third, that participants who may have participated in previous similar surveys will not offer responses that are stereotyped. Lack of knowledge of stroke risk factors is low in this population hence the increasing stroke incidence. Lastly, it was assumed that the tools or questionnaire that will be used in this study would be appropriate in measuring the designated variables.

Scope and Delimitations

The purpose of this research study was to examine the relationship between the knowledge of the individual risk factors for stroke and the stroke experience. The study also investigated if there is a relationship between knowledge of stroke risk factors and the perception of the risk for a stroke. The study took a convenience sample of African Americans visiting the clinics within the South district of Cook County's Ambulatory Care Health Network, some local churches, local beauty shops and barber shops at a certain point in time. Even though a diverse group was considered, this may not be a

representation of the African American population in this district. For this reason, generalizability of the results may not apply to similar populations of same characteristics outside of this district. The study was limited to 273 adults from 18 and older who were not health care professionals.

The HBM which hypothesized on the simultaneous occurrence three classes of factors for health-related action (McKenzie, Neiger & Thackeray 2008, p171-173) was considered but not preferred for this study but some of its constructs was used; perceived susceptibility and perceived threat of disease. The Social Ecological Model was also considered but not fit for this study. The knowledge, attitude and practice were considered to be fit for the study because of the appropriateness of its constructs to the variables.

Limitations

According to Crosby, DiClemente, and Salazar (2006), "study limitations are recognized weaknesses in the research that detract from rigor". Of the common research limitations, the following are the prime limitations expected to be associated with this research study.

- Population: This study will be restricted to African Americans in south district Cook County Illinois. As such for validity consistency reasons, may not be a suitable reference for African Americans in other geographic areas and other ethnicities.
- Self-Reported Data: Respondents documentations are mostly unverifiable self-reports.

- Convenience Sampling: Respondent's selection was not random and so it may not completely be a representation of this population.
- Questionnaire design: Due to the lack of standardized means of ensuring that answers from a population survey are harmonized when and where memory issues arise or inherent.

In an attempt to ameliorate the effects of these identified limitations, the researcher personally conducted the data collection by giving the questionnaire to the participants at the clinics or areas of location and return to the researcher immediately without taking the questionnaires home. To increase the diversity of the section of the population sampled, or to avoid a predominantly one-sided respondent participants study, i.e. to have a better population representation, respondents from some church congregation, barber shop and beauty shops were taken alongside some of the clinics in the south district Cook County Illinois. The questionnaire and its format was based on validated forms for such research purposes and adapted for clarity in all the sections where applicable.

Biases

- Information biases: In health conditions and risk factors information study such as this that is done by a cross sectional survey, respondents' self-reported responses could include a tendency of giving socially acceptable answers rather the facts on objectionable behaviors and abhorred health conditions.
- Selection bias: Respondent's selection was not random and, so it may not completely be a representation of this population. Also, potential researcher

bias in particular participant selection of mostly elderly patients in the clinics. The use of additional sampling pools (from churches and small businesses: barber and beauty shops), infused the correcting measures of cautious multistage systematic sampling to minimize the bias

- Reporting bias: This condition that focused on selective revealing and or suppression of information relevant to the study by the respondent or the researcher is also a cause of concern. To minimize the potential contribution of the respondents to that, the researcher (who administered the questionnaire) asked for honest answers. The researcher associated reporting biases include publication, time lag, duplication, location, citation, and outcome biases, and the following are the measures to eliminate them. They are (a) findings to be published in full and on time, (b) avoid multiple or duplicate publications and limit it to main stream literature, (c) pooling of relevant references from diverse sources and (d) comprehensive presentation of all aspects of the findings (Higgins and Green 2011).
- Measurement bias and error: For this study, the SRFKPQ questionnaire fit the design and purpose of the study. Also, true values of results were reported without favoring a particular result.

Significance

The incidence of stroke is decreasing in Caucasians but not in the African American population with stroke being the second leading cause of death in this population (Lackland, et al., 2014). There is strong evidence that modifying the identified

or known risk factors of stroke can reduce the incidence of stroke (Howard, Cushmann, Kissela, Kleindorfer, McClure, & Saffoord, 2011). These modifiable risk factors can be addressed by certain behavioral changes which include blood sugar control in diabetes, control of blood pressure in hypertension, atrial fibrillation, family history, smoking cessation, reduced intake of alcoholic beverages, maintain a healthy weight, adequate physical activity and healthy diet (Howard, et al., 2011). However, knowledge or awareness of these stroke risk factors and maintaining healthy behaviors have been found to be lacking in the African American population as they have ranked higher in negative lifestyles than their Caucasian counterparts (Howard et al., 2011).

This is an important study as it addressed and illuminated an understudied area in primary prevention of stroke in a population that has documented high rates of stroke and poorer outcomes than other ethnic compositions (Alkadry et al., 2011). Numerous studies have found African Americans to have negative outcomes from stroke (Go et al., 2013). The result of this study will provide insight into the knowledge base of this population regarding risk factors for stroke, their attitude towards stroke factors, the perceived risk of stroke for those with and without known risk factors, stroke prevention practices and also those who have had their first incident stroke. Also, the results from this study will guide stroke prevention by providing tailored or targeted education towards risk reduction in this population.

Identification of the most important risk factor that drives the increased stroke occurrence will aid in targeted primary prevention thus reducing the incidence of stroke in this population. Primary stroke prevention is essential in the African American

population because they experience stroke at a younger age with more negative outcome (Alkhadry, Bhandari, & Blessett 2011). The potential findings will lead to greater awareness and implementation of stroke risk factor preventive measures in the African American individual, communities, healthcare providers and possibly lead to policy changes (Pearson, 2011) that will aid focus on specific risk factor reduction in this population not just in South District Cook County but also nationally and internationally.

Summary

A good deal of research establishes the fact that there is suboptimal knowledge of stroke risk factors among the public specifically African Americans (Alkhadri et al., 2011; Beiderman et al., 2012; Bogoshi et al., 2003; Lackland et al., 2014). Stroke is the leading cause of long-term disability (Ovbiagele et al., 2013), and the need for primary stroke prevention in the African American population cannot be overemphasized. Knowledge of stroke risk factors is of paramount importance in the prevention of stroke. Some of the risk factors for stroke can be modified; high blood pressure, diabetes mellitus, sleep apnea, physical inactivity, carotid artery disease, excessive alcohol consumption, cigarette smoking, atrial fibrillation. Stroke prevention can be achieved by addressing the issues from a socio-ecological view bearing in mind that even though the individual maybe directly involved, the after effect of stroke constitutes a huge individual as well as national problem both in direct and indirect costs (Ovbiagele et al., 2013).

Chapter 2 addressed the review of existing literature on the knowledge of the stroke risk factors in the African American population. This chapter also included an overview of the Knowledge, Attitude and Practice and also a comparative review of

findings on the knowledge of these risk factors in African Americans and Caucasians in the United States. Knowledge of risk factors in general from other United States regions for example “the stroke belt”, other localities and internationals studies were also included. The chapter ended with the implications of past research and its relationship to this study.

Chapter 3 details the design and methodology used in conducting the research. It discussed the tools used in data collection and result analysis. Those involved the sample population, sample size, the procedure for data collection, the questionnaire, and ethical considerations, measures and data analysis. Sample size determination and other relevant analytical statistical methods such as multivariate analysis was also be discussed. Chapter 4 presented the results from the questionnaire analysis and also addressed the research questions that impelled this study and the relationship between the variables. Chapter 5 addressed the findings and the implications of the results of the study. Recommendations for future studies were made based on results.

Chapter 2: Literature Review

This literature review established the need for continued research into how knowledge is acquired, retained, and translated into practice to help individuals reduce their risk for stroke. The relationships between knowledge of stoke risk factors, attitude of an individual or population, the experience and/or perception of stroke, and stroke prevention practices have not been fully explored or researched. Stroke is an ailment that distorts not just the life of the individual but also that of the whole family. Even with the most sophisticated of technology, for some individuals with stroke, life as they knew it will never be the same. There are individual, family, community and societal burdens in caring for someone with stroke. There may be loss of earnings, and basic functional activity as simple as personal hygiene becomes a chore that some will never be able to accomplish on their own. For another percentage of stroke patients, there is inability to control bowel or bladder function, and some remain in a complete vegetative state in a long-term care facility for the rest of their lives. These problems become heightened depending on the age of the individual at stroke occurrence, the severity of the stroke, and the position of the stroke patient in the family.

Introduction

Even though there have been major advances in stroke study, the number of people experiencing a stroke every year has not changed. Approximately 800,000 Americans have a stroke each year (AHA, 2014, Go et al., 2013; Sallar et al., 2010). Of these 600,000 are first occurrence and 185,000 are recurrent (AHA 2014, Go et al., 2013 and Sallar et al. 2010). Further, 150, 000 of these are fatal, which account for 1 in every

19 deaths from all causes (Sallar et al., 2010). On the average, someone in the United States suffers a stroke every 40 seconds, and every 4 minutes, someone dies from a stroke (CDC, 2014, & Go et al., 2013,). By the year 2030, an estimated of 3.4 million strokes in people 18 years of age or older (AHA, 2014) will be added to the 6.8 million people in the United States who have already had a stroke (Go et al., 2013). This will represent an estimated 20.5 percent increase in prevalence from 2012 (AHA, 2014).

Overall, there has been a decrease in stroke mortality, with stroke ranking as the fifth leading cause of death in the United States (Lackland et al. 2014) but in the State of Illinois and South Suburban Cook County, stroke is the third leading cause of death (IDPH, 2013). This could be attributed to the racial disproportionality in stroke occurrence. The African American population is disproportionately affected by stroke compared to their Caucasian counterparts (AHA, 2014). African Americans are also twice as likely to die from stroke and they have more severely disabling strokes than their Caucasian counterparts (Go et al., 2013). In South Suburban Cook County, the stroke mortality rate for African Americans (87.1/100,000) was twice the rate for Caucasians (41.0/100,000) in 2005-2007 and 81% higher than the Healthy People 2010 goal of 48.0/100,000 according to CCDPH (2011).

The relationship between the knowledge and attitude of the African American population regarding stroke risk factors, their individual risk factors for stroke, and their stroke experiences has not been well researched. The purpose of this study was to assess the relationship between the knowledge of stroke risk factors, attitude towards these risk factors, perceptions of stroke, stroke prevention practices, and the incidence of stroke in

the African American population of South Suburban Cook County. This chapter provides an overview of empirical data on the knowledge of stroke risk factors across populations. This chapter presents current peer-reviewed articles concerning the knowledge of stroke risk factors and the incidence of stroke as it relates to the African American population. The approach and methodology for this research was argued with support from current literature. The theoretical framework of this research was rooted in the knowledge, attitude and practice construct. Also, research on health literacy and African Americans is incorporated in this chapter. In conclusion, I discuss how past research influenced this study.

Literature Search Strategy

The literature review on the knowledge of stroke risk factors and the experience of stroke started with digital search of credible data sources and sites. I reviewed hard copy books related to the topic. I used scholarly research from databases such as Walden University library: Science Direct, Sage Publications, Medline, and Academic Search Premier. Also included were American Heart and Stroke Association publications, American Association of Neurology Journals, and other scholarly journals. The list of search terms used for the literature search included *stroke, stroke risk factors, stroke risk factors and African Americans, African Americans and stroke, African American women and stroke, African American Men and stroke, diabetes and stroke in African Americans, smoking and stroke, health literacy, stroke literacy, health literacy and African Americans, stroke risk perception, hypertension and stroke risk perception, diabetes and stroke risk perception, family history and stroke,* and *sleep apnea and stroke.* I made

efforts to limit articles to within the past 5 years but occasionally I used some classic articles within and beyond ten years. Due to individual, regional, and funding interests on research, the scope of literature review references varied. Though I abided by the required preference of sources published within 5 years or less, some older (i.e., before 2010) classic articles were included. Below is an overview of the distribution. The search words depicted as knowledge had more recent articles dating from 2012-2013. Searches referring to gender and populations had more references from 2010-2011, and search words referring to modifiable risk factors were more prevalent from 2010-2015.

Theoretical Foundation

The theories used to guide this research were the KAP theory or model and some concepts in the HBM: perceived susceptibility, perceived benefits, and perceived barriers to taking positive health action. The KAP model has been used in numerous studies to assess the level of knowledge of certain diseases, the attitude of the population regarding the identified disease, and the practices of the studied population to prevent the disease or its risk factors. In a cross-sectional study of 278 respondents, Brasil, Mreira, Tels, Damasceno & Muora (2014) used a KAP questionnaire to assess the level of knowledge, attitude, and practice of women in the postpartum period regarding human immunodeficiency virus (HIV) infection and its prevention. The results from their study showed that knowledge was the driving force to attitude and practice. Because knowledge on HIV prevention was inadequate, so was attitude and practice. Approximately 19.4% showed adequate knowledge, 2.2% showed adequate attitude, and 1.4% showed good practice of HIV prevention (Brasil et al., 2014).

Khalil and Abdalrahim 2014 employed KAP in a clinical trial to study prevention and early detection of chronic kidney diseases in Jordan. The results showed that knowledge was not adequate for preventive activities. Further education on the signs and symptoms was needed to achieve better attitude and practice.

Winham & Jones (2011), in their cross-sectional survey of young African Americans and knowledge of heart disease, noted that despite the high mortality of this population to cardiovascular disease, there were inconsistencies and differences in knowledge and perception. This is essential because knowledge of the risk factors is the first step to preventive activities (Winham & Jones 2011).

In all these studies, KAP was efficiently used to assess the level of understanding of these populations towards the diseases of interest.

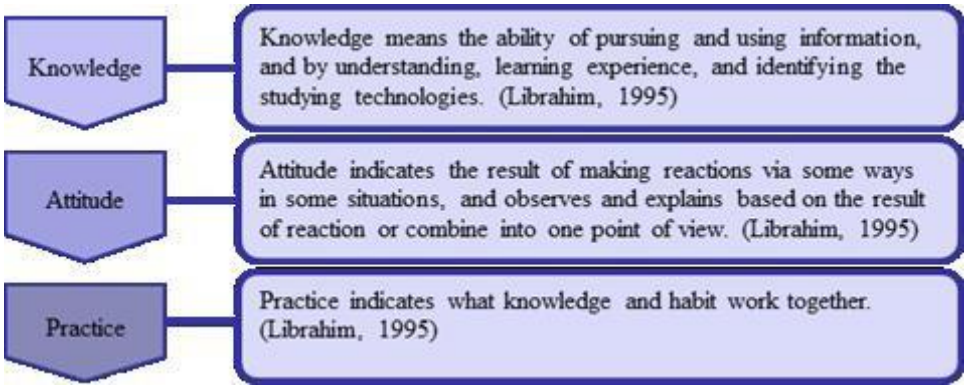

Figure. 1 The influence diagram of knowledge, attitude and practice by Bano et al. (2013).

The second theoretical model that was used in this study was the HBM. The HBM was initially developed in the 1950s by social psychologists and was used in 1974 by

Rosenstock and Kegels to explore the reason for the lack of success in free tuberculosis health screening.

The modified version of the HBM called stroke perception health belief model (SPHBM) was also as a second theory for this study. This 15-item tool was originally designed by Barbara Shiplett (2007) in her dissertation of women and heart disease but was adopted and modified for stroke by Goodman in her dissertation on stroke (2012). This tool is based on the constructs of the health belief model which are perceived susceptibility, perceived benefits, perceived barriers and perceived severity (Shiplett, 2007). Content validity of this tool was evaluated by three content experts on development of research instruments. The pilot study by Shiplett (2007) on reliability showed perceived susceptibility 0.77, perceived severity 0.61, perceived benefit 0.61, perceived barriers 0.70 and perceived benefit 0.61 The SPHBM scale was scored on a five-point Likert scale in her dissertation. Participant were scored as strongly disagree, disagree, neutral, agree, and strongly agree.

The guiding principle or concept of the Health Belief Model (HBM) is centered or hinged on belief: an individual's willingness to act can only happen if the perceive (a) they are susceptible, (b) the disease could be severe, and (c) if the action to be taken is beneficial with less resistance (Rosenstock & Kazdin, 2000). Belief is the key factor that guides a person's behavior and understanding health belief is crucial to preventive action. The original understanding of the Health Belief Model (HBM) was for individual perceived susceptibility, perceived severity, perceived benefits and perceived barriers (Rosenstock & Kazdin, 2000). This has since expanded to add two more constructs: cues

to action and self-efficacy. The HBM has been used in several studies to understand the factors that influence individual behaviors (Sullivan, 2008).

- Perceived susceptibility represents the individual's subjective perception of his personal risk of contracting the disease condition in question (Rosenstock & Kazdin, 2000).
- Perceived severity is how serious the disease could be if and when contracted by the individual (Rosenstock & Kazdin, 2000).
- Perceived benefits is what the individual perceives would be the positive outcome of taking necessary steps towards a better life (Rosenstock & Kazdin, 2000).
- Perceived barrier is what the individual perceives would be the stumbling block to the

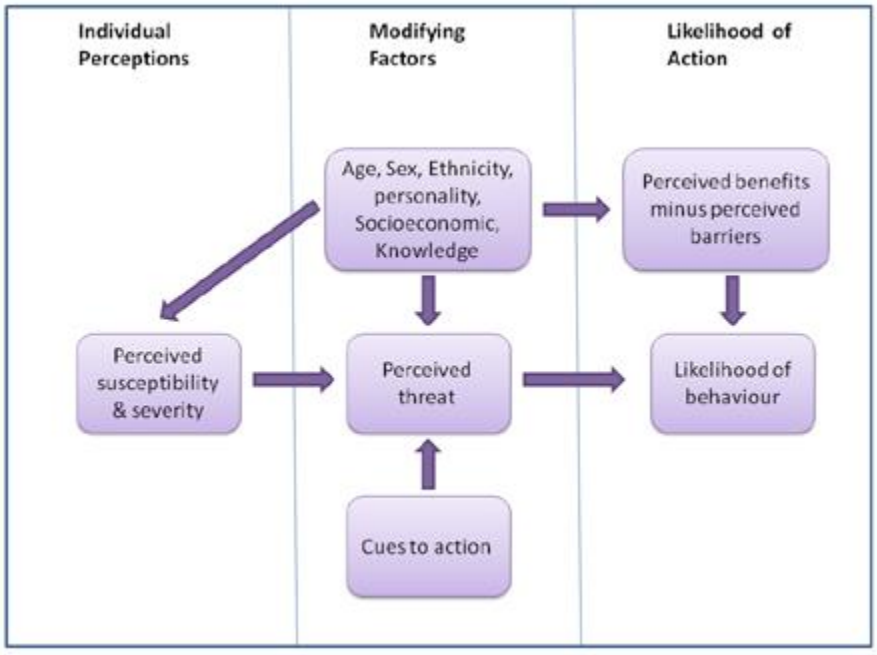

Figure 2: The health belief model flow (Glanz, Rimer and Lewis 2002).

Literature Review Related to Key Variables and Concepts

Stroke

Stroke occurs when there is a disruption of blood supply to the brain which could be as a result of blockage of the cerebral artery or bleeding into the brain tissue causing a stop in oxygen rich blood supply to the brain (Sacco et al., 2013). This literal definition does not capture the clinical picture and so the updated definition of stroke encompasses the clinical and tissue criteria irrespective of areas of focus whether in practice, research or public health assessments (Sacco et al., 2013). Ischemic stroke is thus defined as "an episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction" (Sacco et al., 2013). TIA is defined as a brief episode of neurological dysfunction from focal brain ischemia without acute infarction (Sacco et al., 2013). ICH is a localized collection of blood in the brain parenchyma or ventricles while SAH is bleeding into the subarachnoid space (Sacco et al., 2013). Even though the incidence of stroke has fallen to the fifth leading cause of death in the United States, this is not true for all races and ethnicity (Lackland et al., 2014). In African Americans, stroke is the second leading cause of death, occurs at a younger age than their Caucasian counterparts and with worse outcomes (Lackland et al., 2014). There are certain conditions or risk factors that have been associated with the occurrence of stroke in individuals.

Risk Factors for Stroke

The risk factors for stroke as identified by Goldstein, et al. of American Heart and Stroke Associations 2011 can be classified into two groups' namely (a) nonmodifiable and (b) modifiable risk factors. Nonmodifiable risk factors for stroke;

- Age
- Genetics
- Race/ Ethnicity
- Gender
- Low birth weight

Modifiable or potentially modifiable risk factors for stroke;

- High blood pressure
- Diabetes mellitus
- High cholesterol
- Cigarette Smoking
- Physical inactivity
- Overweight/ obesity and body fat distribution
- Atrial fibrillation
- Sickle cell anemia
- Excessive consumption of alcohol and drug abuse
- Poor diet
- Hyper-coagulation

- Carotid Artery Stenosis and other cardiac conditions
- Post-menopausal hormone therapy
- Diet and Nutrition
- Metabolic syndrome
- Sleep-Disordered breathing: sleep apnea
- Family history of stroke
- Migraine
- Hyper-homocysteinemia
- Elevated lipoprotein (a)
- Inflammation and infection

The need for preventative healthcare cannot be over emphasized especially in relationship to primary prevention of stroke. For people to control their environments they have to be informed, aware, or have the knowledge of what the risk factors for stroke are and their individual risk factors so that they can make the necessary decisions towards controlling them. In the past decade, the relative rate of stroke mortality fell by 35.8% and actual mortality declined by 22.8% (Go et al., 2013). This however has not changed the fact that every year, approximately 795,000 continue to experience a new or recurrent stroke (Go et al., 2014). Stroke remains the leading cause of long term disability with estimated cost $62.7 billion on combined stroke and disability expenditure (Go et al., 2013). As the rate of stroke incidence is increasing so also is the direct and indirect cost. The direct and indirect cost of stroke in 2010 was $36.5 billion (Go et al., 2014). The projected cost of stroke from 2005-2050 is projected at $1.52 trillion for Caucasians,

$313 billion for Hispanics and $379 billion for African Americans (Go et al., 2013). The per capita cost for stroke is highest in African Americans at $25,782, followed by Hispanics at $17,201 and Caucasians at $15,597 (Go et al., 2013). African Americans bear a huge brunt of the burden of stroke in comparison with other racial groups. This is because African Americans have higher prevalence of stroke risk factors that can be altered by behavior or lifestyle changes for example diabetes, hypertension, and high cholesterol (Alkadri, Bhandary & Blessett, 2011).

Knowledge of Stroke Risk Factors

Recent studies in stroke have focused on the symptomology and or early identification of the warning signs of stroke and timely arrival to a stroke center for possible thrombolysis but few, if any studies have been conducted on the knowledge of stroke risk factors especially in a population with the worst impact or burden of stroke: African Americans. Even though the knowledge of the warning signs of stroke is important, the most effective treatment of a stroke is prevention and a major step in stroke prevention is knowledge of the risk factors and learning how to reduce them.

General public baseline knowledge of stroke risk factors is low (Biederman, et al. 2012). Thirty nine percent knew of high blood pressure as a risk factor for stroke, 52% were aware of diabetes and stroke, 44% responded to poor diet, 44% did not know and 33% identified stress as risk factor. Their findings also showed a suboptimal knowledge of the five stroke risk factors in African Americans (Biederman, et al., 2012). In the study of a Jordanian population, the average score of stroke risk factor knowledge was 2.7 out of 6 and 47% of the study population could not name any stroke risk factor (Eshah,

2013). Similar finding was also reported in a study five years earlier by Koenig, Whyte, O'Donnell, Skidmore, Penrod, & 2007 and 15 years earlier by Kothari, Saubbeck et al. 1997 of suboptimal knowledge of stroke risk factors from a sample of stroke patients who were not able to name one risk factor of stroke at 52% and 53% respectively. Similarly, a 2010 survey study of African Americans resident in Mississippi about knowledge of stroke factors discovered that many did not know how lifestyle factors such as lack of physical activity, excessive alcohol consumption, diabetes, smoking, and high cholesterol contribute to stroke risk (Sallar et al., 2010). Awareness therefore is the first step or strategy in stroke prevention (Travis, 2003), and is a strategy to stall the incidence of stroke in the African American population. Prevention requires knowledge of the risk factors and a willingness to implement prevention strategies (Lackland et al., 2013, & Travis, 2003). Lack of understanding of the risk factors for stroke impedes any high technology prevention strategies. There is strong evidence that modifying the risk factors for stroke will greatly reduce the incidence of stroke by as much as 80% (Howard, Cushmann, Kissela, Kleindorfer, McClure, & Saffoord, 2011 & Meschia et al., 2014), and so every occurrence of stroke can thus be considered as a failure of primary healthcare (Lackland et al., 2013).

Current trends in stroke risk factor knowledge have not changed much in the past decade. A study by Schneider, Pancioh, Khoury et al., 2003 noted that African Americans had the least knowledge of stroke risk factors. In a cross-sectional study by Alkadry et al. (2011), they noted that disparities in knowledge gap of stroke risk factors does exist between African Americans and Caucasians however there were significant differences in

identifying certain stroke risk factors by Caucasians and African Americans: example elevated cholesterol, previous stroke, smoking, and race. Seventy nine percent of African Americans were aware that high cholesterol is a stroke risk factor as against 86% in Caucasians, 31.4% were aware of the differences in stroke and gender, and 56% were aware of age and stroke as against 73.2% Caucasians. Biederman et al., (2012) in their study of baseline stroke knowledge in two North Carolina Counties discovered that despite advances in treatment of acute stroke, there was a baseline global lack of knowledge of the risk factors of stroke. In the African American population of the study, only 43% correctly identified the brain as the area of the body affected in a stroke, 16% identified the head, 13.3% identified the heart as the organ affected by stroke, and 13.5% do not know the organ and another 13.6% choose other. Hypertension was identified by 39.8% of African Americans as a top risk factor, 9% identified diabetes mellitus and 8.2% did not know. Sallar et al. (2010) in their study focused on individuals being able to identify stroke risk factors and warning signs. There was low knowledge of stroke risk factors in the African American population of this Mississippi delta region. Specifically, 52.7%, 56.4%, 53.2%, 38.3%, and 28.7% could not identify lack of physical activity, excessive alcohol consumption, diabetes, smoking, and high cholesterol, respectively, as stroke risk factors.

In a population-based study of the knowledge of the risk factors for stroke conducted by Muller-Nordhorn et al, in 2006, 68% participants correctly identified more than one risk factor for stroke, 10% correctly identified, 20% identified two, 25% identified and 13% correctly identified four risk factors. However, the study by Ellis on

stroke related knowledge in male stroke survivors living in the South Carolina stroke belt refuted the notion of lower stroke knowledge among African Americans in the South Carolina sample. Another finding in his study was that the African Americans in his population were younger and less educated than their Caucasian counterparts. These studies show the need for better education of communities on the risk factors for stroke that can be influenced at the individual level. Even though there are many emerging risk factors for stroke, the knowledge of the major traditional risk factors (high blood pressure, diabetes mellitus, high cholesterol, atrial fibrillation, excessive alcohol consumption, family history, inadequate physical activity, obesity and smoking) for stroke were discussed in this study.

Knowledge of the Modifiable Risk Factors for Stroke

High Blood Pressure

High blood pressure or hypertension is the single most important risk factor for a stroke: ischemic or hemorrhagic (Lackland et al., 2013) and African American adults have the highest prevalence of high blood pressure in the world (Mozaffarian et al. 2016). According to American Heart Association/American Stroke Association Heart and Stroke Statistics (2013), non-Hispanic blacks over or equal to age 20, 42.6% of the men and 47.0% of the females have high blood pressure (Go et al., 2013). In 2009 6,574 African American males and 6,951 African American females died from high blood pressure related causes (Go et al. 2013). The overall death rate from high blood pressure was 18.5 per 100,000 but for African Americans it was 51.6 per 100,000 and 38.3 per 100,000 for males and females respectively (Go et al., 2013). Additionally, overall death rate for

stroke was 38.9 per 100,000 but the rates for African Americans were 60.1 per 100,000 for males and 50.2 per 100,000 for females (Go et al., 2013). One in three African American has high blood pressure according to the American Heart Association 2014 compared to the national average which is one in four. After adjusting for age, the death from stroke is almost 40% higher in African Americans than Caucasians (CDC, 2014).

Knowledge of high blood pressure or hypertension is well documented in numerous studies as a risk factor for stroke by study participants, but it remains under treated (Sloma et al., 2010, Howard et al 2011, & Biederman et al., 2012). Hypertension was identified by 39.8% of African Americans as a top risk factor in the study of two North Carolina's Counties and 8.2% do not know any risk factor for stroke (Biederman et al., 2012). Jones et al 2010 in an in-depth review of literature discovered that there was poor knowledge of stroke risk factors. Lower risk factor knowledge was found to be common in African Americans and people of low educational levels (Jones et al., 2010). In the review, only 36% identified high blood pressure as a risk factor for stroke agreeing with the study findings of six years later by Biederman et al., 2012. Eighty six percent of the participants in the study by Willey, Williams & Boden-Albala 2009 identified hypertension as a risk factor for stroke. In a study by Sallar et al., (2010), 90% of the participants identified high blood pressure as a risk factor for a stroke. Even though there are varying results on the knowledge of high blood pressure as a risk factor, it remains the most identified risk factor for stroke in all the literatures reviewed.

Diabetes Mellitus

Diabetes mellitus is an independent risk factor for stroke (Meschia et al., 2014). Diabetes more than doubles the risk for stroke and approximately 20% of people with diabetes will die from stroke (Meschia et al., 2014). In 2010 an estimated 19.7 million had a diagnosis of diabetes which represents 8.3% of the United States population (Go et al., 2014). Diabetes prevalence is increasing alongside with increased prevalence of overweight and obesity (Go et al., 2014). African Americans are two times more likely to be diagnosed with diabetes, and more than 2.2 times more to die from diabetes than their Caucasian counterparts (Schiller, Lucas, & Peregoy, 2012). People with diabetes have higher stroke rate (Weltermann, Driouach-Bleckmann, Reinders, Berndt, Gesenhues, 2013). The relative risk for stroke is 1.8 to 6 in people with diabetes (Weltermann et al., 2013).

In a cross-sectional questionnaire survey of 250 diabetic patients from Germany and Turkey in a primary care, and diabetes clinic to determine their stroke knowledge, there was no difference between the groups (Weltermann et al., 2013). Their study discovered the lack of knowledge of stroke risk factors among diabetics in natives and migrants in Germany (Weltermann et al., 2013). On logistic regression of the data, patients younger than 61 years had better stroke knowledge than those older. Conversely in the study of baseline stroke knowledge in the Delta region of the stroke belt, only 9% identified diabetes mellitus and 8.2% did not know (Biederman et al., 2012), and 53.2% of participants in the study by Sallar et al. (2010) identified diabetes as risk factor for stroke. The stroke belt is made up of 11 southern states (McClure, Murphy, Roseman,

Howard, and Malarcher, A., 2011). The buckle of the stroke belt is made up of the coastal plain region of North Carolina, South Carolina, and Georgia and the stroke belt is made up of the remainder of North Carolina, South Carolina, and Georgia, plus Alabama, Mississippi, Tennessee, Arkansas, and Louisiana (McClure et al., 2011). These 11 states have the highest rates of stroke incidence and mortality in the United States (McClure et al., 2011). It is encouraging to note that from the studies, African Americans are knowledgeable to a great extent about the association between high blood pressure and stroke but less knowledgeable on the relationship between diabetes, and irregular heart rhythm with stroke (Sallar et al., 2010). Furthermore, in a questionnaire study of people with previous stroke or TIA, less than 50 percent identified diabetes mellitus as a risk factor for a stroke (Sloma et al., 2010). These studies demonstrated that the knowledge of diabetes mellitus as a stroke risk factor for stroke was low even in this population that had experienced a stroke showing the lack of knowledge of diabetes as an important risk factor for stroke.

Other Modifiable Major Risk Factors for Stroke

Atrial Fibrillation

Atrial fibrillation even in the absence of other heart conditions increases the stroke for a stroke four to five times (Meschia et al., 2014). Approximately two to three million Americans have some sort of abnormal conduction that predisposes them to lose emboli (Meschia et al., 2014). Atrial fibrillation accounts for 10% of ischemic strokes and most cases occur without any prior diagnosis (Meschia et al., 2014). Even though the knowledge of the relationship has improved, most people do not know what atrial

fibrillation is nor do they know its association with stroke especially in the African American population (Soliman, & Prineas, 2014). Less than 50% of the study population identified atrial fibrillation as risk factors for stroke in the study by Sloma et al., 2010. The prevalence of atrial fibrillation risk factors among African Americans is greater than their Caucasian white counterparts even though they have lower incidence of the disease (Soliman & Prineas, 2014). Also, African Americans have a higher incidence and mortality of atrial fibrillation related stroke than other ethnic Americans (Soliman & Prineas, 2014 and Karcher et al., 2015), however only one third of African American as against Caucasians are aware of their Atrial fibrillation status (Turama, Velagapudi, Visotcky, Szabo, & Kocheril, (2012).

Obesity

One of the health consequences of being overweight or obese is stroke. Being overweight or obese is a risk factor for stroke and especially when it is in concomitant with other risk factors like high blood pressure, diabetes, and high cholesterol (Meschia et al., 2014). In 2009, the prevalence of obesity was 35.7% in adults and 16.9% in children (Meschia et al., 2014). Abdominal fat is a greater predictor for stroke than BMI (Meschia et al., 2014). A study by Finkelstein, Brown, and Evans, (2008) was conducted to determine if overweight and obese people understood or perceived the increased risk associated with obesity related ailments. Even though the results revealed that overweight and obese people did recognize that they were at risk for conditions associated with excess weight including stroke (Finkelstein, Brown, & Evans, 2008), other studies reported otherwise. Eshah (2013) in a study of stroke knowledge in a Jordanian

population revealed that only 53% mentioned obesity as a risk factor for stroke. Obesity in African Americans increased by an annual percentage change (APC) of 3.48% after adjusting for other covariates in the Delta Mississippi region (Mendy & Vargas, 2015). This is important information especially with this region having higher obesity than the nation in 2010 (Mendy & Vargas, 2015).

Excessive Alcoholic Consumption

The Substance Abuse and Mental Health Services Administration (SAMHSA) defines heavy alcoholic consumption as taking five or more drinks on the same occasion on each of five or more days in the past 30 days. Heavy drinking has been identified as a risk factor for all types of strokes (Meschia et al., 2014). Independent studies of the association between excessive alcohol consumption and stroke is well documented. The Health Professionals follow up study and the Nurse's Health Study both showed the increased risk for stroke in women who drank excessive alcohol (Chiuve, Rexrode, Spiegelman, Logroscino, Manson, & Rimm, 2008). Also, excessive alcoholic consumption was associated with increased stroke in Chinese men (Bazzano, et al., 2007). A 22% increase in stroke was noted in people who took more than 21 drinks in one week and people who took one to six drinks had the lowest risk for stroke (Bazzano et al., 2007). Consumption of 60g of alcohol in a day was associated with 64% increase in all stroke risk (RR, 1.64, 95%CI, 1.39-1.93) 69% increase in risk for ischemic stroke (RR1.69, 95% CI, 1.34-2.5), and more than double the risk for hemorrhagic stroke (RR, 2.18, 95% CI, 1.48-2.30) (Bazzano et al., 2007). This is especially important because moderate to heavy alcohol consumption is associated with elevated blood pressure which

is the most important risk factor for stroke (Meschia, 2014; Jaubert, et al., 2014, & Zhang, Qin, Chen, Jiang, Chen, Xu, 2014). Excessive alcohol use is an independent risk factor for stroke (Meschia, 2014). Excessive alcohol consumption increases hypercoagulability (increases blood viscosity), reduces cerebral blood flow, and increases the risk of atrial fibrillation (Meschia, 2014). Bozzano et al., (2007) discovered a 22% increase in stroke in Chinese men who drank at least 21 alcoholic drinks in a week in support of the association between alcohol and stroke. Also, individuals who have high blood pressure and consume excessive alcohol are twice at risk for stroke than people that do not drink excessively (Meschia, et al., 2014).

Other Major Risk Factors

High cholesterol, smoking, physical inactivity, family history are all other major risk factors. In a study by Sallar et al., (2010) on stroke awareness among African Americans, 90% of the participants identified high blood pressure as a risk factor for a stroke while high cholesterol 28.7%, smoking 38.3%, lack of exercise 52.7%, diabetes 53.2, increasing age 28.2%, irregular heart beat 31.4%, family history 55.9% and excessive alcohol consumption was at 56.4. The participants mentioned stress as the second most important risk factor for a stroke at 82.4% which was not accurate because stress is not a stroke risk factor. Family history, obesity, smoking and cocaine use were identified as stroke risk factors at 66.7%, 59.1%, 44% and 37.4% respectively (Willey et al., 2009). Also, it was noted that healthcare professionals scored less in providing stroke information at 43.1%, as against the media at 45.7%, and family members at 51.1% (Sallar et al., 2010).

Family History

Family history as a risk factor is not a new concept regarding prevention of stroke but there is limited data on how its use can influence stroke prevention (Aycock, Kirkendoll, Coleman, Clark, Albright, & Alexandrov, 2014). Family history can be a very valuable tool in stroke, as it has been used in genetic epidemiology of cancer and Parkinson's diseases with good results (Hopper, Bishop, & Easton 2005). Currently, family history is not well documented in clinical practice with chart audits showing that approximately 20%-50% of patients with risk factors for diseases based on family history did not have them documented in their charts (Wang et al., 2012). As much as family history or information is important to all, it is even much more important in African Americans because of early age of first stroke and the high mortality associated with it in comparison with their Caucasian counterparts (Aycock, et al., 2014). However, in this cross-sectional study, 50% reported family history of stroke: parent, grandparent or sibling (Aycock, et al., 2014). There were no statistically significant differences between those with family history and those without family history of stroke in knowledge of the stroke risk factors (Aycock, et al., 2014). The participants were made up of 71% women, 89% had at least 12 years of education and 62% were unemployed (Aycock, et al., 2014). Eighty two percent of the participants with family history of stroke identified family history as a stroke risk factor against 58% of the participants without family history (Aycock, et al., 2014). There was a general low stroke risk factor literacy and perceived risk for stroke in this group as noted by the researchers (Aycock, et al., 2014).

Physical Activity

According to Healthy People 2020, 80% of American Adults and Adolescents are not meeting up to their recommended physical activity levels. Increased physical activity has been taught to not only prevent diseases such as stroke but to assist in improving the overall quality of life of the individual (HP 2020). Even though the relationship between physical activity and stroke is not well established, the study showed that there is stroke prevention benefits as the intensity of the physical activity is increased in ischemic stroke (Autenrieth, Evenson, Yatsuya, Shahar, Baggett, and Rosamond, 2013). Sedentary lifestyle was the most common risk factor in a Jordanian study population and yet only 18.8% listed physical inactivity as a risk factor for stroke (Eshah, 2013). Similarly, physical activity was low in the delta Mississippi region among African Americans in a decade long surveillance study at 38.7% (Mendy and Vargas, 2015).

Cigarette Smoking

Every assessment of stroke risk factors had identified cigarette smoking as doubling the risk of ischemic stroke (Meschia et al., 2014). Cigarette smoking increases the risk for ischemic stroke and sub arachnoid hemorrhage by two to four-fold and potentiates the effects of the other risk factors for stroke (Meschia et al., 2014). Participant in several studies have identified smoking as a risk factor for stroke 38% (Sallar et al., 2010), 77% by (Travis et al., 2003), 44% (Willey et al., 2009) and 20% by Sloma et al., 2010 and yet even though currently smoking has declined in the United States from approximately 20.9% in 2005 to 18% in 2013, 17.8% an estimated 42.1 million of United States adults aged 18 years and older are currently smoking and 18.3%

of these smokers are African Americans (CDC, 2014). A study of the prevalence of stroke risk factors in the Mississippi region revealed that smoking is increasing in African Americans while it is decreasing in Caucasians (Mendy & Vargas, 2015). Smoking is not only an independent risk factor for stroke, it also influences the severity of ischemic stroke especially in small vessel or lacunar occlusion (Weng, Huang, Chien, Wu, Su, & Hsu et al., 2011). This finding is especially important because African Americans have more lacunar strokes than Caucasians. In a comparative study of multi ethnic differences in stroke types, 22% of African American in the study had lacunar stroke when compared with 7% of Caucasians (Koch, Gupta, McClendon, & Romano, 2013). Also smoking accelerates the arteriosclerotic process, smoking increases the risk for stroke two to four times more than those who did not smoke (Go et al., 2014), and potentiates the other stroke risk factors (Meschia et al., 2014).

Sleep Disordered Breathing

Another emerging stroke risk factor in sleep disordered breathing. Sleep disordered breathing or sleep apnea is one of the potential risk factors of stroke. Four percent of Americans have sleep apnea (Meschia et al., 2014). People with sleep apnea most times have other stroke risk factors such as high blood pressure, diabetes, atrial fibrillation, obesity, and high cholesterol (Meschia et al., 2014). Obstructive sleep apnea is an independent risk factor for a stroke (Mansukhani, Calvin, Kolla, Brown, Lipford, Somers, Caples 2013 & Meschia et al., 2014) but no studies have been conducted thus far to evaluate the knowledge of this condition as a risk factor for stroke. Increasing sleep apnea is associated with progressive increase in stroke especially in males (Meschia,

2014). Sleep apnea is an important but neglected stroke risk factor and yet 70% to 80% of patients with this condition are neither diagnosed or treated (Meschia, 2014). Even though the prevalence of sleep apnea is low at 4%, any added risk factor to this already vulnerable population will increase the burden of the disease of stroke no matter how small. Also, atrial fibrillation is prevalent in patients with sleep apnea, with 25% of the patients having atrial fibrillation (Yaranov, Smyrlis, Usatii, Butler, Petrini, Mendez, & Warshofsky, 2014). Further, the risk of stroke is increased in individuals who have both sleep apnea and atrial fibrillation (Yaranov, 2014). Also, a study by Mansukhani et al., 2013 claimed that obstructive sleep apnea may increase the risk of atrial fibrillation by up to four-fold.

Perceived Risk for Stroke

Stroke risk perception in light of this study is the belief knowledge or awareness by an individual that they will have a stroke which may be soon or later based on their knowledge or no knowledge of their personal risk factors for stroke. It is assumed that the knowledge of the risk factor for an ailment will provoke a desire for the individual to manage their risks in order to prevent the event from occurring (Boden-Albala et al., 2011 & Eshah, 2013). Managing the traditional risk factors for stroke have been researched and found to reduce the incidence of stroke but despite ongoing efforts to create awareness for stroke and encourage people to manage their personal risk factors, individuals at highest risk for stroke still do not perceive themselves at risk. Accurate risk perception is valuable in both primary and secondary prevention of stroke. In a population of people with prior stroke, only 20% accurately estimated their risk for

recurrent stroke while 10% underestimated and 70% overestimated their risk (Boden-Albala et al., 2011).

The perceived stroke risk in the study by Wang et al., (2012) were perceived low risk ranging from 37%-46%, and perceived high risk 6%-11%. Yang, et al. (2013) population study among community residents in China, even though stroke awareness was rated between 53% and 87%, the perceived risk for stroke was only 18%. As the number of stroke risk factors increased, the perceived risk for stroke in this population also increased in the age range of 45-64 years. In those with one stroke risk factor, the perceived risk factor was 16.5%, those with two risk factors the perceived risk was 38%, those with two or more risk factors had a perceived risk of 32%, and the perceived risk was 41% among those with more than three or more stroke risk factors perceived themselves to be at risk (Yang et al., 2013). The perceived risk for stroke was higher in participants who were 45-64 years than those who were 65 years and older at 21% and 10% P=0.019. The educational level of those 45 years to 64 years was also higher than those 65 years and older (Yang et al., 2013).

Health Literacy

Twenty five percent of adult Americans have limited literacy skills and low literacy is also associated with worse health outcomes (Shea, Beers, McDonald Quistberg, Ravenell, & Asch 2004). The Patient Protection and Affordable Care Act of 2010, Title V, defined health literacy “as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions”. Health literacy is not a new concept but

has become the focus of some recent studies. Despite the "presumed" public health education on how to prevent diseases, chronic disease prevalence and incidence has continued to increase due to increasing risk factors. Many studies have tried to connect the relationship between health literacy and health outcomes with varying results. Inadequate health literacy has major negative health implications even though its association with stroke is not well documented (Sanders, et al., 2014).

The annual number of strokes in a year has remained constant at approximately 795,000 for the past ten years (Mozaffarian, 2016). Stroke incidence is said to be decreasing only in Caucasians but not in African Americans and yet African Americans have the highest number of modifiable risk factors for stroke (Kleindorfor, et al., 2014). In a prospective study conducted by Sanders et al., (2014) to assess the impact of health literacy on education retention of stroke patients, of the 100 participants in their study, 59% had inadequate or marginal health literacy. Even though their results did not show any significant difference between participants with adequate literacy and those with marginal literacy, the participants with low health literacy had lower retention capacity for contents taught in stroke education (Sanders et al., 2014).

Health literacy is an important component of health communication (Parker & Gazmararian, 2003). In an outstanding study on functional health literacy by William, Parker, Baker, Parikh, Pitkin, and Coates (1995), one third of English speaking participants and 61% of Spanish speaking participants in public hospitals had inadequate or moderate health literacy. In this same study by William et al., (1995), 42% did not understand the direction on their medication bottle, 26% did not understand the direction

on their appointment paper, and 60% did not understand an informed consent. Further research also showed that more than 69% of Spanish speaking and 22% of English speaking patients in Los Angeles and 57% of the Atlanta patients had inadequate functional literacy (Williams, Baker, Parker, & Nurss, 1998). Low literacy in individuals leads to low knowledge of their medical conditions (Williams, Baker, Parker, & Nurss, 1998). Individuals with the greatest healthcare needs in the United States are least able to understand the information they need to successfully navigate and function in our complex healthcare system (Parker & Gazmararian, 2003).

Stroke Literacy

According to the World Health Organization (2013), people with low levels of literacy are associated with poorer overall health status, and reduced ability to manage chronic diseases (Gazmararian, & Parker, 2003). Stroke literacy is the knowledge of stroke risk factors and warning signs or symptoms (Wiley et al., 2009). Morren and Salgado (2011) assessed stroke literacy in a South Florida population from 2006-2010. The Cleveland Clinic yearly stroke prevention screening questionnaire revealed a stroke risk factor awareness of 74.2%, and the overall stroke literacy was 17.8% in a study population of 298 participants who were mostly Caucasians. The age of respondents in this population was greater than 65 years and the results correlated with other studies on low health literacy especially in elderly populations. This population shows non-encouraging similar levels or degree of stroke literacy as other studies have found even though 59% had college education. Healthcare provider are supposed to be at the pioneering wheel of stroke education of the public and providing correct information, but

mass media was identified as the source of information on the stroke risk factors which of course influenced the information received (Muller-Nordhorn et al., 2006).

In the study of public awareness of stroke in Korea, Kim et al. 2012 noted that the most common source of stroke information was from mass media and least from physicians even though patients viewed physician information as the most reliable. Also, in the study by Morren and Efrain (2013), only one third of the respondents said they received stroke information from healthcare providers. Knowledge or awareness of stroke risk factors is limited in African Americans and yet the burden of stroke is greater in this population (Sallar et al., 2010). Beal's explorative descriptive study of 2014 on the stroke education needs of African American women discovered that knowledge of stroke in this group was from family members and not from any organized stroke educational campaigns which coincides with the results from Muller-Nordhorn et al., (2006) that much of the information received was from mass media and not an organized stroke education campaign.

Gaps in the Literature

Knowledge, attitude and practice of healthy lifestyle are paramount to the control of stroke risk factors. Few studies have examined the knowledge of stroke risk factors in the African American population instead of margining them with other racial groups (Alkadri et al., 2011). Of the major stroke risk factors, the number of published studies on Africans Americans associating alcoholism, diabetes, and sleep apnea as stroke risk factors is limited. Also, their knowledge of some others such as high blood pressure, smoking and obesity is suboptimal. As such, part of the thrust of this study was to

contribute to filling that knowledge gap. Also, the perception or attitudes on prevention has not been explored.

Conclusion

The relationship between the stroke experience and the knowledge of risk factors for stroke and perceived risk factors for stroke in African Americans is limited. If the burden of stroke must be reduced in this population, risk factors reduction should be considered as the strategy for primary prevention. Racial disparities in stroke risk factors awareness should be considered seriously especially in populations with stroke increased incidence and prevalence such as African Americans (Alkadry et al., 2011). Research has consistently shown that Stroke morbidity and mortality is more severe in African Americans than any other racial or cultural group (AHA, 2014, CDC, 2014). Poor knowledge of stroke risk factors is modifiable (Alkadry et al. 2011). A classical study by Williams, Baker, Parker & Nurss (1998), (also referred to by Shea et al., 2004 & Johnson, 2014) confirmed that people with low literacy cannot fully comprehend medical information using standard educational materials. In more recent studies on health literacy, Rapid Estimate of Adult Literacy in Medicine (REALM) scores was significantly lower in African Americans than in Caucasians (Shea, et al., 2004). In a review of health literacy in an Australian population by Johnson (2014), 59% of the population aged 15-74 had low literacy skills. Also, according to the World Health Organization (2013), “literacy is a stronger predictor of an individual’s health status than income, employment status, education level and racial or ethnic group”.

In a few studies, healthcare providers were not identified as the primary source of education on stroke risk factors which is of concern. For someone to influence or change their behavior or personal risk factors, they must understand what those risk factors are (Bogoshi et al., 2003). Health literacy as a tool to assess disease knowledge is important since patient's education is important in assisting people to understand their risk factors and the behavioral changes required to effectively manage their condition on daily basis (William et al., 1998). Perceived risk for stroke can only be accurate if the individual understands their personal risk factor. Knowledge and risk perception should be considered exclusively for African Americans as the results can be used to develop effective programs to reduce the risk of stroke in this population.

The quality that is derived from studies depends on the rigor of the methodology used in the study. In the past, various methods which include prospective cohort studies (Shea et al., 2004), cross-sectional surveys (Williams et al., 1998, & Travis et al., 2003), and longitudinal perspectives (WHO, 2013) have been used to assess these factors. However, a cross-sectional study with its numerous advantages is suitable to this study. Some of which include (a) not requiring much time to accomplish (Frankfort-Nachmias and Nachmias 2008 p.116-118), (b) its peculiar ability to assess relationship among variables for a given population (Crosby et al., 2015), (c) allowing the researcher to make population inferences even with collection of data on multiple variables (Crosby et al., 2015). In Chapter 3, I described in detail the methodology for this study.

Chapter 3: Research Method

Introduction

The purpose of this research study was to examine the relationship between knowledge of the individual risk factors for stroke, attitude towards the risk factors for stroke, and the stroke prevention practices in the African American population of the South District of South Suburban Cook County in the State of Illinois. In the study I also sought to ascertain the existence and the nature of relationship between knowledge of stroke risk factors and the perception of the risk for a stroke in the adult African American population of South District Cook County. In this study, I specifically investigated how the independent variables, both individually and in combination, relate to the knowledge of stroke risk factors and stroke, the stroke experience, the perception of stroke, and sources of stroke information in this population. This is especially important so as to determine the risk factor that drives the increased stroke experience in the African American population of South Suburban Cook County. In this chapter I describe the study design, sample, instrumentation, data analysis, and ethical considerations. Further, I discuss the rationale for the study design, the sample characteristics and size, instrumentation, data collection process, and data analysis.

Research Design and Approach

This quantitative study used a cross-sectional research design with two independent variables. This design was to explore the relationship between knowledge of stroke risk factors, attitude of the respondents towards stroke factors, and stroke prevention practices. This relationship was scored using stroke risk factor knowledge

questionnaires. I selected a quantitative study design because it provided empirical data on the magnitude of the lack of knowledge of stroke risk factors as the driving force behind increasing stroke risk in this population. Further, the study's results provide additional support and further highlight the need for better preventive measures in the area of stroke awareness strategies. The cross-sectional study design was used to identify a subset or portrait of this population at one point in time. The many advantages of the cross-sectional design are (a) it is less expensive, (b) it does not require much time to accomplish, and (c) it provides a snapshot of the population to be studied (Frankfort-Nachmias & Nachmias, 2008, p.116-118). Specifically, I preferred a cross-sectional design because it has the means to assess the relationship among variables for a given population (Frankfort-Nachmias & Nachmias, 2008). It allows the researcher to make inferences about the population from its subset at a defined point in time, reveal trend patterns, and identify areas for further studies, all within a short time and with minimal resources. Also, the cross-sectional design allows for collection of data on multiple variables, can maximize completeness of key data, can use a large number of subjects and dispersed subjects, can helps to answer the *who, what, how,* and *where* questions, is useful to other researchers, and requires no follow-up (Crosby et al., 2015). Cross-sectional designs can also be used to document the prevalence of a health problem (Crosby et al., 2015).

The analytical cross-sectional study design assisted me in exploring the relationship or association between the independent and dependent variables. Even though some of these variables have been studied in the past, those studies were on

predominantly Caucasian populations, and no study has been done that is specific to the African American population of South Suburban Cook County with regards to knowledge of stroke risk factors and the stroke experience. Therefore, even if a relationship exists, the variable(s) of interest that are driving the increasing incidence and prevalence of stroke in this population have not been identified. Without this information from tis study, public health leaders, healthcare providers, and consumers will not have the necessary information to provide appropriate stroke preventive activities or services.

Study Variables

The independent variables for this study were knowledge of risk factors for stroke (cigarette smoking, elevated cholesterol, diabetes mellitus, excessive alcohol consumption, over weight and obesity, prior stroke, carotid artery disease, high blood pressure, physical inactivity, atrial fibrillation, family history, and sleep apnea), and perception of stroke (notion or understanding of stroke) in patients with known risk factors and those without risk factors. The dependent variables are stroke/ TIA and perception of stroke (fated to have stroke). Sociodemographic variables for this study included the participant's height, weight, gender, marital status, education level, zip code, income, and age. I collected behavioral variables such as smoking and alcohol consumption. I also collected pertinent medical history such as hypertension, diabetes, sleep apnea, carotid artery disease, atrial fibrillation, family history of stroke, prior stroke or TIA, and high cholesterol. These collectively assisted in defining the at-risk population.

Methodology

Population and Setting

South District Cook County is bordered to the north by Chicago and the east by the state of Indiana. Cook County population is larger than that of 29 individual U.S states and a combination of seven smallest states in population (CCDPH, 2012). It is the second most populous county in the United States (CCDPH, 2012) and had the largest black population of any county in the United States in 2013 at 1.3million (U.S. Census Bureau, 2015). According to the CCDPH, the total population of residents of the South District Cook County was 471,792 in 2010 with those 18 years to 84 years making up 71.6% of the population. However, African Americans constituted 24.6% of the entire county's population estimate of 2014, which was 5,246,456 million (U.S. Census Bureau, 2015).

Table 1

Community Profile: Cook County Department of Public Health Jurisdiction, Illinois: 2010

Selected characteristics	Demographics	
Population demographics	Number	Percent
Ages <1 year	27,089	1.2
1-5	145,648	6.4
6-13	249,295	11.0
14-17	137,591	6.1
18-24	188,608	8.3
25-49	755,135	33.3
50-64	452,627	20.0
65-84	262,216	11.6
85 and older	49,000	2.2

Table 2

Community Profile: Cook County Department of Public Health Jurisdiction, Illinois: 2010

Selected characteristics	Demographics	
Population demographics	Number	Percent
Black	370,000	16.3

As shown in the Tables 1 and 2, 73.2% of the population was between 18 years and 84 years in South District Cook County in 2010. For the African American population, 73.2% of 370,000 is 270,000, so the population of interest in this study is an estimated 270,000, of which a convenience sample of 273 was drawn from the African American population of South Suburban Cook County. This group had a stroke mortality rate of (87.1/100,000), twice the rate for Caucasians (41.0/100,000) in 2005-2007 and 81% higher than the Healthy People 2010 goal of 48.0/100,000 according to CCDPH (2011). This was not surprising because the top risk factors for stroke are prevalent in this population. The rate of uncontrolled hypertension hospitalizations from 2008 to2009 among African Americans in South Cook County was 392.3/100,000, about six times that of Caucasians (67.3/100,000). Diabetes related hospitalizations among African Americans in South Cook County in 2008 to 2009 was 2,243.7/100,000, which was more than double that of Caucasians (846.6/100,000), Furthermore, 16% of adults and 12% of high school students used tobacco in 2010, 7 in 10 adults in 2009 did not meet the minimum standards for physical activity, over 75% of high school students in 2010 were not physically active for 60 minutes every day, 75% of adults in 2009 and 80% of high

school students in 2010 did not eat the recommended five servings of fruits and vegetables per day, and one in four adults (25%) in 2009 and 11% of high school students in 2010 self-reported as being obese (CCDPH, 2011).

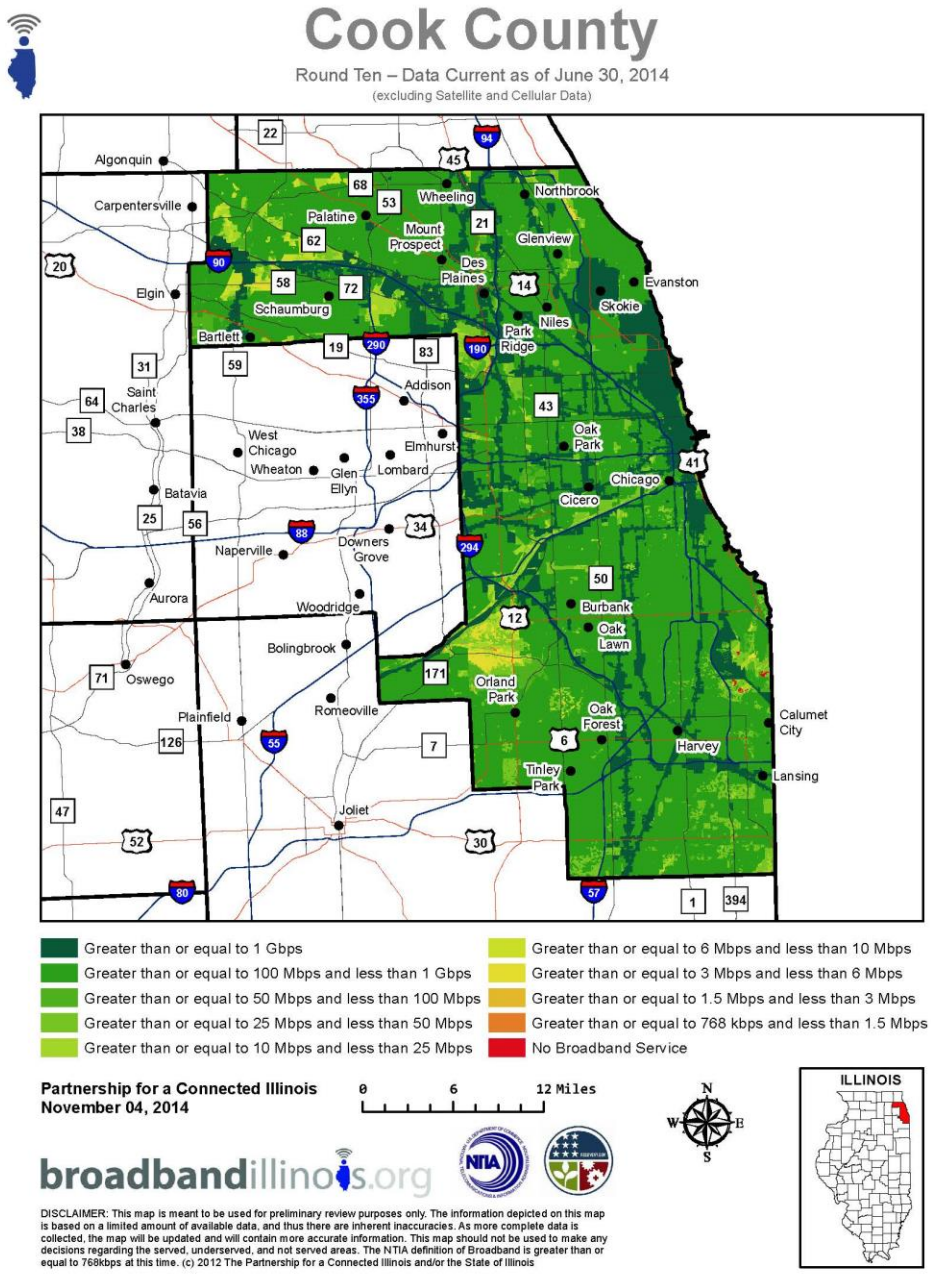

Figure 3. Map of Cook County, Illinois, and surrounding cities.

Population/Participants

The sample population for this study was adult African Americans from ages 18 and older, who are currently residing in the south district area of suburban Cook County Illinois. Stroke can happen at any age and according to the Center for Disease Control one in seven strokes occur in adolescents and young adult between the ages of 15 and 49 (CDC, 2016). According to Flannagan et al., 2011, approximately 10 to 14 percent of ischemic strokes occur in adults 18 to 45 years. Some experts posit that the increased stroke in the young stems from increased obesity, diabetes, high blood pressure, and poor lifestyle in this age population (CDC, 2016). More than one third of people over age 20 are obese, one in four men and one in five women between the ages of 35-44 have high blood pressure and one in eleven Americans have diabetes (CDC, 2016).

African Americans younger than 45 have double the risk of stroke than their Caucasian counterparts due in part to the increased rate of traditional stroke risk factors of diabetes, high blood pressure, sedentary lifestyle and obesity in this population (CDC, 2016). Influencing health behavior change in the young is an important strategy towards healthier lifestyle throughout the stages of the life cycle (Winham & Jones 2011). This will also help tailor public education messages on stroke prevention to include this group.

The participants in this study were a convenient sample of adult male and female residents of the South district of Suburban Cook County in the State of Illinois. The sample was made up of only adult African American residents of the area. Participants were drawn from varying locations in the South district such as churches and the Cook County Hospital and Health System. Most of the participants were patients visiting one of

the primary care clinics within the Cook County Hospital and Health System (CCHHS) irrespective of their ailment. I also identified several churches with medium attendance of 500 adults of predominantly African American origin. Also, some of the sample was from local residents with no particular affiliation with the locations mentioned above like barber and beauty shops. Due to the nature of this study, there was no discrimination other than race/ethnicity of the participants to be recruited from these locations, but care was taken to ensure that all age groups were well represented.

Inclusion Criteria

Participants in this study were individuals meeting the following criteria:

- They are of an age that can provide informed consent 18-75.
- They must be English speaking.
- They must have reliable telephone service.
- They must be resident in the South District of Cook County Illinois at the time of study.
- Participants must be African Americans.
- Comorbidities and prior strokes accepted.
- The participants must be cognitively sound.

Exclusion Criteria

The exclusion criteria for this study included:

- They must not be physicians.
- They must not be midlevel practitioners (for example nurse practitioners, clinical nurse specialists and physician assistants).

- They must not be registered professional nurses.
- They must not be healthcare care providers with a 4-year college degree.
- They must not be prisoners.
- They must not be mentally incompetent persons.
- They must not be persons less than 18 years of age.
- Participants must not be mentally or emotionally disabled.

They must not be subordinates of the researcher. This exclusion of physicians, midlevel practitioners; nurse practitioners and physician assistants, registered professional nurses and healthcare providers with a 4-year college degree is based on the understanding that the knowledge, skill, and experience of these individuals would have classed them as a control group. However, the questionnaire survey methodology being used does not provide for a control group.

Sample Size

Power analysis was used to determine appropriate sample size for this study. The sample size for this study utilized the Cohen D model using the alpha level and effect size to calculate the number of the study participants. The reason for this choice was because Cohen D model is considered the standardized difference between means and effect sizes. This model classifies differences of 0.20 as small, 0.50 as medium and 0.80 as large thus allowing comparison between studies (Thalheimer & Cook, 2002). A minimum sample size of 273 was needed to provide adequate power to perform this analysis. The minimum sample size of 273 participants was calculated from an online sample size calculator; this is the G* power. The sample population was set at 20000 since the sample

size does not change significantly for populations larger than 20000. The margin of error was set at 5%, with 95% confidence interval and response distribution at 50%. This size based on Cohen D model allows for making inferences to the larger population.

Procedures for Recruitment

Power analysis revealed that for a one tailed test at $p<.05$, to detect an effect size of 0.20 with a power of 0.80. The results were calculated using an alpha level of 0.05, power of 0.80 and medium Cohen D and 0.50. The participants in this study came from multiple locations or sites as discussed earlier; churches, Ambulatory and Community Health Network ACHN clinics at the south district of Cook County Illinois, barber and beauty shops as already stated. Introductory information regarding the study and informed consent forms was given to participants in person at the sites. The informed consent form included a concise background of the study, the procedures for participation, confidentiality of information, voluntary nature of the study, and other ethical concerns. Respondents were not required to sign any consent because their agreement to participate in the study was taken for consent. The researcher's contact information (email) specially created for this research was given to participants should they have any further questions.

Upon receiving IRB approval from Walden University (approval number _11-22-16-0246335), IRB approval from CCHHS will also be sought and obtained before approaching the clinics for data collection. After receiving approval from Cook County IRB, the researchers approached the Director of the Ambulatory and Community Health Network (ACHN) of CCHHS at the south cluster and explained the dissertation to her for

approval to recruit participants who come into the clinics. Participant recruitment was by in person conversation. Data for the study was collected using a written questionnaire given to the participants at the areas identified for this study; clinics, churches, local barber shops and beauty salons. Individuals who showed interest in the study were given the questionnaire to fill out and returned to the researcher. To make sure that the recruitment did not interfere with clinic visit, questionnaire was given before or after clinic at the clinic waiting areas. Patients that met the eligibility criteria for the study were asked to participate in the study. Specific recruitment dates were made available at the sites and a separate table set up with questionnaires. The researcher explained the study to the respondents and questionnaires given. Participants were thanked and then given a full package of stroke education materials that included risk factors, warning signs of stroke, how to reduce risk for stroke and what to do if experiencing stroke symptoms.

Same mode of operation was replicated at the other sites: churches, barber and beauty shops. The researcher approached church administration and owners of barber and beauty shops to recruit participants from its members or customers respectively after explaining the dissertation to them. A table was step up at a convenient area of the sites to administer consents and questionnaires. All questionnaires were collected at the end of the exercise.

After the administration of the questionnaires, participants were thanked and given a full package of stroke education materials which included risk factors, warning

signs of stroke, how to reduce risk for stroke and what to do if experiencing stroke symptoms. This was a onetime data collection and so no follow up needed.

Instrumentation and Materials

The questionnaire was designed to ensure that the study content was completely represented; content validity for this study is important in evaluating the instruments and its appropriateness to make sure that the hypothesis can be accurately described to capture all variables it is supposed to capture (Frankfort-Nachmias & Nachmias 2008 p. 151). The questionnaire was organized into three sections which were socio-demographic data, knowledge and perception of stroke risk factors, and thirdly, participant's stroke risk factor sources of information. This study therefore implored a combination of tools since no single questionnaire was found in literature that is specifically focused on knowledge of risk factors for stroke. The instrument that was used for the data collection was referred to as SRFKPQ (see Appendix E). This instrument was adopted from three reliable and validated stroke risk factor knowledge questionnaires namely the SKT, SRQ, and SAQ.

The first part of the questionnaire was participant demographics which included gender, age, zip code, weight, height, years of school completed, behavioral history; smoking, alcohol, recreational drugs, medical history; stroke, diabetes, high blood pressure, sleep apnea, atrial fibrillation. BMI for each respondent was calculated by the researcher. All questionnaires were collected at the end of the exercise before the patients left the clinic/church/shop. All questionnaires were coded to keep data anonymous and no

part of the questionnaire had any participant identifiers; name date of birth or medical record numbers.

Stroke Knowledge Test. The SKT is a valid and reliable tool with good content coverage, acceptable item properties and positive expert review ratings for assessment of stroke knowledge (Sullivan & Dunton, 2004). The tool was developed by Dr. Sullivan (2004). A copy of the tool with the answers was obtained by directly contacting Dr. Sullivan through email and permission to use the tool was also granted. A copy of the correspondence is available in Appendices A and B. The SKT questionnaire is a 20-question tool, 9 of which is focused on the knowledge of stroke risk factors. The tool is widely used and has been translated into other languages; Portuguese (Sullivan, & Dunton, 2004) and Arabic (Eshah, 2013). The results from the psychometric investigations were established at Cronbach of 0.65 suggesting it is not only a reliable tool it is also a valid tool in assessing stroke knowledge (Sullivan, & Dunton 2004). The SKT questionnaire was translated into Arabic by Eshah, 2013 in her study of Knowledge of Stroke and Cerebrovascular Risk Factors in Jordanian adults. In her study, face validity and content validity were established for this version and Cronbach's alpha was 0.68 (Eshah, 2013). The internal consistency check for this tool on stroke risk factors yielded acceptable reliability (Kuder-Richardson coefficient 0.55) (Sullivan, White, Young, Chang, Roos, & Scott, 2006).

Stroke Awareness Questionnaire. The SAQ was developed by Hickey, Holly, McGee, Conroy, and Shelley (2013) with the aim of examining the knowledge of stroke risk factors and warning signs in the adult population in Ireland. A copy of the SRQ was

obtained by contacting Dr. Hickey directly by email. Permission to use the instrument in this study was granted by Ms. Connan as directed by Dr. Hickey as evidenced by her email consent. A copy of all correspondence is available in Appendix C. SAQ is divided into five sections which covered both the socio-demographic data of the patient and also personal medical history, stroke warning signs, what actions to take if experiencing a stroke and other stroke related questions. For this study, I only took and modified the questions related to stroke risk factors and socio-demographic data for my study.

The Stroke Recognition Questionnaire. The SRQ is a reliable instrument for determining knowledge of stroke risk factors and warning signs. SRQ is a 20-question item tool with 10 questions each of risk factors for stroke and non-risk factors for stroke. This tool was developed by Dr. Ennen in 2004 to assess the level of stroke knowledge; risk factors and stroke symptoms among rural and non-rural residents in six East Central Illinois. Content validity was determined by an expert panel of nationally recognized stroke experts in stroke care and research; physicians and nurses. Content validity was determined by using the content validity index (CVI; Waltz, Strickland & Lenz, 1991). It was determined that the SRQ had good content validity for both the symptom item list (CVI = .90) and the risk factor item list (CVI = 1.00). The questionnaire as a whole scored a CVI of .95. The SRQ's reliability was initially assessed by administering the SRQ to a convenience sample of 34 members of the lay public two weeks apart. The test-retest correlations for the subscales of the SRQ were stroke symptom r = .80, non-stroke symptom r = .75, stroke risk factor r = .44 and non-stroke risk factor r = .44. Internal consistency reliability was computed for the SRQ for stroke symptoms and stroke risk

factors in this data set (n = 566) using the Kuder-Richardson Formula 20 (KR20). The stroke risk factor subscale and stroke symptom subscale alphas were .70 and .81, respectively (Ennen & Zerwic 2012; Ennen & Beamon, 2012). Content validity was determined by using the content validity index which showed good content validity for risk factors item list at CVI=1.00. Reliability also showed r =.44. Kuder-Richardson 20 (KR20) was used to determine internal consistency which showed alpha at 0.70 (Ennen and Zerwic 2010). The researcher sent emails to Dr. Ennen and Zerwic for permission to use and modify the tool for this study, and approval for use can be seen in Appendix D.

The Stroke Risk Factor Knowledge and Perception Questionnaire. The SRFKPQ is a modification of relevant portions of the above three widely used reliable and validated stroke risk factor questionnaires; namely the SKT (, SAQ, and SRQ by Sullivan (2004), Hickey et al. (2013), and Ennen & Zerwic (2010) respectively. This tool examined the knowledge and perception of stoke in this population of African Americans which no studies thus far has been published.

Each participant was given a copy of the SRFKPQ and asked to self-disclose his or her socio-demographic information; gender, age, zip code, height, weight, educational achievement, medical history and behavioral habits. Even though there has been much research in stroke, there is no single tool identified that is stroke risk factor specific for the assessment of risk factor knowledge thus the need for this new tool.

Operationalization of the Variables

Independent Variables

The variables were calculated by the tabulation of the standard scores: observations that fall into each category or group. The variables were categorized of a maximum of four but with scores ranging from zero to three. The totals for each category represent the participants subject to such within the study areas.

Knowledge of cigarette smoking is the awareness and ability to correctly identify cigarette smoking as a risk factor for stroke. Cigarette smoking is the habitual inhalation of burning tobacco from encased pipes, cigars and cigarette irrespective of daily quantities consumed. This independent variable was measured on a categorical scale of three. The participants smoking scores were recorded as 0 = No/never or 1 = Quit, 2 = occasional and 3 = daily. The variable was calculated by the tabulation of the standard scores: observations that fall into each category or group. The total for each category represents the participants subject to such within the study areas. An example item was the total number of the non-smokers i.e. under the category of no/never.

Knowledge of high blood pressure is the awareness and ability to correctly identify High blood pressure as a risk factor for stroke. High Blood Pressure or Hypertension is defined as a having a systolic blood pressure $\geq$ 140 mmhg and a diastolic blood pressure $\geq$ 90 mmhg or self-reporting of history of hypertension and taking of medications for hypertension. This independent variable was measured on a categorical scale of four. Participants were recorded as either 0 = no (does not have hypertension based on medical examination) or 1 = yes (has it and is taking medication), 2 = yes (has it

but not taking medication) and 3 = does not know. The variable was calculated by the tabulation of the standard scores: observations that fell into each category or group. The totals for each category represents the participants subject to such within the study areas. An example item was the total number of participants with self-recorded medical history of hypertension who are on antihypertensive medications i.e. under the category of; yes.

Knowledge of atrial fibrillation is the awareness and ability to correctly identify atrial fibrillation as a risk factor for stroke. Atrial fibrillation is an irregular heartbeat where there is inadequate emptying of the heart chambers resulting in blood clots or history of atrial fibrillation or taking anticoagulation medication for a heart condition. This independent variable was measured on a categorical scale of four. Participants were recorded as either 0 = No (does not have atrial fibrillation based on recent medical examination) or 1 = yes (has it and is taking medication), 2 = yes (has it but not taking medication), and 3 = does not know.

Knowledge of family history is the awareness and ability to correctly identify family history as a risk factor for stroke. Family history of stroke refers to a history of stroke in the immediate blood family. This independent was measured on a categorical scale with three categories. Participants were recorded as either 0 = no or 1 = yes and 2 =does not know.

Knowledge of diabetes mellitus is the awareness and ability to correctly identify diabetes mellitus as a risk factor for stroke. Diabetes is the condition in which sugars build up in your blood. This is a condition where there is an abnormal high level of sugar in the blood or self-reported diabetes history or taking medications for diabetes. This

independent was measured on a categorical scale of four categories. Participants were recorded as either 1 = no or 2= yes; 0 = no (does not have diabetes mellitus based on recent medical examination) or 1 = yes (has it and is taking medication), 2 = yes (has it but not taking medication), and 3 = does not know.

Knowledge of previous history of stroke is the awareness and ability to correctly identify previous stroke as a risk factor for stroke. The Stroke Experience or Previous Personal History of Stroke (ischemic stroke, ICH, SAH, or TIA) is self-reported history of previous stroke or TIA of the participant.

Knowledge of increasing age or aging is the awareness and ability to correctly identify aging as a risk factor for stroke. Aging or advancing age is getting older in age.

Knowledge of physical inactivity is the awareness and ability to correctly identify physical inactivity as a risk factor for stroke. Physical inactivity is a term used to identify people who do not get the recommended level of regular physical activity. The American Heart Association recommends 30-60 minutes of aerobic exercise three to four times per week. This independent variable was measured on an ordinal scale with four categories. This variable will be measured on an ordinal scale with four categories with responses coded as 0, 1, 2, or 3.

Knowledge of carotid artery disease is the awareness and ability to correctly identify carotid artery disease as a risk factor for stroke. Carotid artery disease is a disease in which a waxy substance called plaque (plak) builds up inside the carotid arteries. You have two common carotid arteries, one on each side of your neck. They each divide into internal and external carotid arteries. The internal carotid arteries supply

oxygen-rich blood to your brain. The external carotid arteries supply oxygen-rich blood to your face, scalp, and neck. This independent variable was measured on a categorical scale of three. Participants were recorded as either 1 = No, 2 = yes, or 3 = do not know.

Knowledge of elevated blood cholesterol is the awareness and ability to correctly identify high blood cholesterol as a risk factor for stroke. Cholesterol is a waxy substance that's found in the fats (lipids) in your blood. While your body needs cholesterol to continue building healthy cells, having high cholesterol can increase your risk of heart disease. When you have high cholesterol, you may develop fatty deposits in your blood vessels. Not all cholesterol is bad. This independent variable was measured on a categorical scale of three. Participants were recorded as either 1 = No, 2 = yes, or 3 = do not know.

Knowledge of sleep apnea is the awareness and ability to correctly identify sleep apnea as a risk factor for stroke. Sleep apnea is a common disorder in which you have one or more pauses in breathing or shallow breaths while you sleep. Breathing pauses can last from a few seconds to minutes. They may occur 30 times or more an hour. Typically, normal breathing then starts again, sometimes with a loud snort or choking sound. Sleep apnea usually is a chronic (ongoing) condition that disrupts your sleep. When your breathing pauses or becomes shallow, you'll often move out of deep sleep and into light sleep. As a result, the quality of your sleep is poor, which makes you tired during the day. Sleep apnea is a leading cause of excessive daytime sleepiness: Self-reported history of snoring. This independent variable was measured on a categorical scale of three. Participants will be recorded as either 1 = No, 2 = yes, or 3 = do not know.

Knowledge of excessive alcoholic consumption is the awareness and ability to correctly identify excessive alcoholic consumption as a risk factor for stroke. Excessive alcoholic beverage consumption is when a man consumes more than two beers a day and a woman consume more than one beer a day was measured on an ordinal scale with five categories. The Substance Abuse and Mental Health Services Administration (SAMHSA) defines heavy alcoholic consumption as taking five or more drinks on the same occasion on each of five or more days in the past 30 days. According to National Institute on Alcohol Abuse and Alcoholism, one "standard" drink contains roughly 14 grams of pure alcohol, which is found in any of the following:

- 12 ounces of regular beer, which is usually about 5% alcohol
- 5 ounces of wine, which is typically about 12% alcohol
- 1.5 ounces of distilled spirits, which is about 40% alcohol

However, Meschia et al 2014 differently defined excessive alcohol consumption as 1.5 fluid ounces of 80 proof spirits as one standard drink. This independent variable was measured on a categorical scale of five. Participants were recorded as either never/stopped, less than one drink in a day, one to two drinks in a day, three to four drinks in a day and more than five drinks in a day.

Knowledge of overweight/obesity is the awareness and ability to correctly identify overweight/obesity as a risk factor for stroke. Overweight/obesity: Overweight is BMI greater than or equal to 25.0 kg/m^2 and less than 30.0 kg/m^2. Obesity is BMI greater than or equal to 30.0 kg/m^2. Extremely obese is BMI greater than or equal to 40.0 kg/m^2.

Dependent Variables

Stroke is the occlusion or bleeding into the brain which may or may not result in functional deficits. The participants of this study were drawn from diverse settings to achieve a near normal distribution of the age groups and categories. This was measured on a categorical scale with three categories. Participants were recorded as either 1 = no, 2 = yes, 3 = does not know.

Stroke experience refers to individuals who have had any of the three types of stroke described earlier: ischemia, TIA, hemorrhages (ICH, SAH).

Transient ischemic attack is a condition where an individual feels numbness or tingling on one side of the face or body which lasts for a few minutes and goes away.

Ischemia is a stroke that presents with weakness of one side of the face or body or slurred speech which persists, and the individual comes into the hospital due to the deficits or lingering sign and symptoms. Self-reported history of an infarct (blood clot in the brain) and or diagnosis by the physician.

Hemorrhages (ICH, SAH) present with blinding headache and brings patient to the hospital and is told by the physician that they had a bleed in their head. Other signs and symptoms are weakness on one side of the body and self-reporting of physician diagnosis of a bleed into the brain.

Stroke perception is a person's feeling that they are prone to have a stroke in the near future: fated or not fated to have a stroke.

Stroke knowledge is defined as being able to correctly identify all the traditional stroke risk factors; family history of stroke, high blood pressure, diabetes mellitus, atrial

fibrillation, age, race and ethnicity, high cholesterol, smoking, and excessive alcohol consumption including sleep apnea were measured using categorical measurement.

Stroke prevention practice is defined as knowledge of the risk factors of stroke and engaging in positive lifestyle activities: recommended physical activity, dietary modification, taking medications as prescribed, not smoking and no drinking excessive alcohol.

Data Collection and Analysis

Data Collection

This was a cross-sectional study with data collected only at one point in time. Data was collected by means of a questionnaire containing 18 items. The researcher collected 273 fully completed questionnaires. After the required number of data had been collected, while confidentiality of the respondents was strictly maintained; the data was entered into a secured database accessible only to the researcher. Data editing and cleaning are two very important steps in data processing and should be done before data analysis (Frankfort-Nachmias and Nachmias 2008 p. 314). The questionnaires were reviewed for any missed data points and that all questions were marked correctly. Data was reviewed for inconsistencies and errors in responses and any errors found in the data invalidated the questionnaire from analysis. Data was proofread to catch and make corrections and correct inconsistencies.

The SRFKPQ is an appropriate tool for this study because it is focused towards knowledge of stroke risk factors and perception of stroke. The SRFKPQ was developed out of three widely used validated and reliable stroke risk factor knowledge instruments.

This 18-item tool was used in this study to examine the degree of relationship between the independent variables and themselves and between the independent variables and the dependent variable. Also, the SRFKPQ targeted not just the risk factors but also stroke perception and the source of information of stroke knowledge in this population.

Research Questions and Hypotheses

RQ1: Is there any significant association between knowledge of the stroke risk factors—hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County?

$H_0$1: There is no significant association between knowledge of the stroke risk factors— hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County.

H_a1: There is a significant association between knowledge of the stroke risk factors— hypertension, diabetes mellitus, high cholesterol, obesity, atrial

fibrillation, carotid artery disease, old age, sleep apnea, over weight/obesity, family history, sickle cell disease, , smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County.

RQ2: Is there any significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

$H_0$2: There is no statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

H_a2: There is a statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

Data Analysis Plan

The questionnaires were scored manually, and descriptive statistical analysis was conducted with SPSS. To correctly answer the research questions, descriptive analysis was conducted on the socio-demographic variables, and regression was performed to examine or assess the strength of relationship of the independent variables to stroke risk factors. Proportionate distribution of the respondents' responses to questionnaire issues

(i.e. in the form of frequencies and percentages) where applicable (such as for the age groupings and BMI) the tabulated findings, illustrated some of the analyses. Also, to guide the analysis of respondents' levels of stroke risk factors knowledge and perception since such derive from inter-related variables such as socio-demographic factors, level of income, sources of stroke knowledge etc. a bivariate chi square analysis was used to further analyze data. Also, a multivariate analysis was used to predict the factors that determine and or influence perceptions and knowledge of stroke risk factors.

Invariably the above stated data analysis approach assisted to statistically verify and validate for the research population both the null and alternate hypotheses associated with the research questions. For those the following highlights some of the issues from the research questionnaire.

- The age groups observed trends (notable peculiarities) such as;
- Where samples were more easily taken from viz for the youth (less than 30 years) the elderly (above 55 years of age).
- Contributions of life style dispositions to research focus.
- Prime source of stroke information for the different age groups (which ought to aid and suggest avenues for education on prevention and management).
- If sample life style norms associated with marital status significantly reflect on the research question for this population (observed trend relationships).
- If sample BMI trends within the age groups and gender with reference to family medical history reflects significantly on research focus and possible outlook.

- Does the village of respondents' residents give an indication of where more easily sample would be taken? Furthermore, does age, state of health and or lifestyle features largely influence whether sample could be taken from clinic, church, or beauty/barber shops?
- How collected data would reflect on significance of levels of education for the research focus as well as its correlation to gender, BMI, lifestyle factors and perceptions.
- How collected data would reflect on significance of the two top levels of income groupings, correlated to family medical history, lifestyle factors, levels of education on knowledge of stroke risk factors and sources of knowledge on perceptions on stroke.
- A p-value of less than 0.5 will be considered statistically significant for all the tests.

RQ1: What is the nature of the association between knowledge and attitude of high blood pressure, diabetes mellitus, sleep apnea, cigarette smoking, excessive alcohol consumption, atrial fibrillation, family history of stroke, personal history of stroke, high cholesterol, overweight/obesity, and physical inactivity, as risks for stroke and stroke prevention lifestyle practices in the adult African American population of south district Cook County?

Independent variables: knowledge of high blood pressure diabetes mellitus, sleep apnea, cigarette smoking, excessive alcohol consumption, atrial fibrillation, family history of

stroke, personal history of stroke, high cholesterol, overweight/obesity, and physical inactivity.

- Dependent variable: stroke prevention practices.
- Statistical test to be used: Chi square analysis.
- Rationale: Chi square analysis was used to answer this research question when both variables are nominal or categorical data type and they can be quantified using frequency measurements.

RQ2: What is the nature of the association between sources of stroke information and previous stroke in the adult African American population of south district Cook County?

- Independent variable: source of stroke information
- Dependent variable: previous stroke.
- Statistical test to be used: Chi square analysis
- Rationale: Chi square analysis was used to answer this research question when both variables are nominal or categorical data type and they can be quantified using frequency measurements.

Multiple linear regression analysis was used to predict "Perception of stroke: Fated Stroke-Yes" (some are fated to have stroke) from high cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, Stress, atrial fibrillation, HA, family history, four or greater drinks per day, obesity, exercise, and previous stroke/TIA.

Threats to Validity

Internal Threats to Validity

Of all the ten (10) main types of internal validity threats, only five (namely: history, regression, selection, mortality and instrumentation) have reasonable bearing to this questionnaires design including its content, timing and setting. That no control group is to be used in the survey grossly minimizes or eliminates the threats of diffusion of treatment, resentful demoralization and compensatory rivalry among respondents (Creswell, 2009). The following are however the response measures factored in to minimize the potential effects of each of the above five mentioned threats to internal validity.

History: This threat type arises due to events occurring during the study period that may unduly influence outcomes. This was effectively minimized by administering only the same questionnaire to the respondents of all the south district Cook County towns/villages within a short period of time.

Regression: This threat type possesses a course for concern by the distortion to analysis established by the extreme scores recorded by a significant number of respondents selected for the study. For this questionnaire study, respondents who by training and experience would potentially record such scores are health practitioners. To effectively minimize such contributions, those have been included in the excluded group.

Selection: This threat type arises when participants who have peculiar characteristics that would predispose them to certain outcomes are included. To minimize the potential of distortion of this type of threat, this survey sampled a wide span of adult

age 18 years and older. The sampling sites which are health clinics, churches, barber and beauty shops within the surveyed district were broad and randomly chosen.

Mortality: This threat type consequence arises when respondents drop out during extended study period for whatever reasons. To eliminate or reduce the potential contribution of this type of threat, the administration of this questionnaire was on a prompt one-time basis. Also, the respondents' sample to be recruited would be large enough to exceed the minimum required for human population health survey. This survey's calculated sample size was estimated to be 273.

Instrumentation: This threat type potential distortion is introduced when the survey's instrument (questionnaire) in context and or content used for the pilot survey differs from that administered on the research respondents, thus impacting on the outcome scores. Since the instrument of this study is a modification of validated questionnaires, a test run with a pilot survey would not be under taken or needed. The benefit of that is that this threat type is eliminated.

To reduce threat to testing, only one questionnaire was used and participants were encouraged to avoid filling the questionnaire twice to avoid duplication and extreme scores (Creswell, 2009 p. 163). Even though the sample is not randomized, the researcher ensured participation selection to capture the different age groups and all the areas of south district Cook County.

External Threats to Validity

The basic sources of external threats to validity include characteristics of the individuals selected for the sampling, the uniqueness of the setting, and the timing of the

data collection (Creswell, 2009). However, these types of validity threats arise when the researcher's findings generalize beyond the target group and into other racial and social groups. Also, if the generalizations include other setting, a past or future situation, certain measures or responses are recommended to minimize this type of validity threat which include; (a) limiting of the primary comparative references to recent studies of similar settings and racial groups, (b) also rather than evaluating the perception characteristic of individual respondents, age group analysis of participants' perception is undertaken. That minimizes the interaction of selection and the treatment type of external validity threat.

Some of the potential methodological (quantitative) weaknesses of this study are the fact that quantitative research method which deals mostly with numerical numbers and may not accommodate explanations which cannot be numerically matched for a better understanding of the problem (Creswell, 2009 p. 145). This weakness can be overcome by conducting another research combining the quantitative and qualitative research methods for a more robust study in understanding not just between variable relationships but also experiences in the practice setting.

Ethical Considerations

Participant privacy was very important in this study. All participants read but were not required to sign an informed consent form. The consent form included information regarding (a) participants, (b) confidentiality of information, (c) risks and benefits of the study, (d) voluntary nature of the study, and the researcher's contact information. No participants expressed the wish to have copies of the study once completed. All information collected from participants were kept confidential and till five

years after the study has been approved at which point it will be incinerated. In the interim, all collected questionnaires has been securely locked up in a locker and accessible only to the researcher. Electronic database, CD, and flash drive will be code secured (password) and also accessible only to the researcher.

Summary

The cross-sectional design was used in this study. SPSS was used for data analysis. Descriptive, multivariate and logistic regression models were used to address the study's research questions. This chapter also presents the methods that were used for data collection, instrumentation in this case SRFKPQ, strategies to maintain participant confidentiality and some ethical concerns that could have arisen during the study. Chapter 4 is used to present the results of the study.

Chapter 4: Results

Introduction

The purpose of this cross sectional quantitative research study was to examine the relationship/association between knowledge of the individual risk factors for stroke and the perception of stroke, and the relationship between knowledge of stroke risk factors and the source of stroke information in the African American population of the South District of South Suburban Cook County in the State of Illinois. In this chapter I describe the study design, sample, instrumentation, data analysis and ethical considerations. I also discuss the rationale for the study design, the sample characteristics and size, instrumentation, data collection process, and analysis.

Research Questions and Hypotheses

The RQs and hypotheses were derived from the review of literature on stroke risk factor awareness or knowledge in the African American population. The overarching questions that guided this study were to determine if there is a relationship/association between knowledge of stroke risk factors and stroke, and also whether the perception of stroke risk explains the incidence of stroke in this population that is higher than the rest of the State of Illinois and the Healthy People 2020 goal? To answer this question, I explored the nature of the relationship between the knowledge and attitude of the respondents' individual stroke risk factors and stroke prevention practices and their perception of stroke. Also, I explored if the sources of stroke information in this population of African Americans in South District Cook County to determine if that is affecting their knowledge of the stroke risk factors. The study employed a correlational

research design using linear regression analysis. The instrument used for the measurement of the variables in this study allowed for regression analysis, and the questions and hypothesis also reflected this type of analysis. The specific research questions were:

RQ1: Is there any significant association between knowledge of the stroke risk factors—hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, arthritis, stress, old age, sleep apnea, exercise, smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA history—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County?

$H_0$1: There is no significant association between knowledge of the stroke risk factors—hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, arthritis, stress, old age, sleep apnea, exercise, smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA history—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County.

H_a1: There is a significant association between knowledge of the stroke risk factors—hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, arthritis, stress, old age, sleep apnea, exercise, smoking, alcohol consumption (four or greater drinks a day), and previous history

of stroke/TIA history—and perception on stroke risk factor (that some people are fated and some are not fated to have a stroke) in the adult African American population of South District Cook County.

RQ2: Is there any significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

$H_0$2: There is no statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

H_a2: There is a statistically significant association between source of stroke information (medical practitioners) and previous TIA/stroke in the adult African American population of South District Cook County?

Data Collection

Population and Demographics

A convenience sample of 273 African American adults (age 18 and older) from the South District of Cook County Illinois voluntarily participated in this study. Participants included in the study were from two predominantly African American churches, CCHHS local South District Health Centers, and from beauty and barber shops within the district. The questionnaire consisted of 18 questions that focused on sociodemographics, personal and family health history, lifestyle, stroke risk factor knowledge, perception of stroke risk factors, sources of stroke information, and 10-year perception of stroke occurrence based on health information. Full details regarding the

study questions can be found in Appendix E. In this study I assumed that the reason for the high incidence of stroke in this population area was due to lack of knowledge of the risk factors and also negative assumptions about stroke.

Sample Demographics

Over a period of 8 weeks in the spring of 2017, 273 questionnaires were given out to willing respondents at the locations and collected back from them. Of those who responded, 113 (42%) were men and 160 (58%) were women. Approximately half of the study participants were single (142, 52%), a quarter were married (78, 29%), 84 (30%) completed high school, and 73 (27%) and 64 (23.4%) completed some college or college respectively. More than half of the participants (152, 56%) earned less than $20,000 per annum and 157 (57%) had BMI of 30 or greater. More than half (151, 55%) of the participants were between the ages of 45 and 64.

Table 3 summarizes the demographic characteristics of the study sample.

Table 3

Demographic Characteristics of Respondents

Characteristics	Total	
	Freq	Percent
Marital Status		
Single/Widow/Widower	163	59.9
Divorced	32	11.7
Married	78	28.4
Education Level		
Less than High school	53	19.3
High School	83	30.7
Some College	137	50.0
Gender		
Male	113	41.6
Female	160	58.4
Income ($)		
Less than or equal 30,000	203	74.5
31,000 - 60,000	50	18.3
More than 60,000	6	2.2
Age (Yrs)		
18 - 24	14	5.1
25 - 44	71	25.9
45 - 64	150	55.1
> 64	38	13.9
BMI kg/m^2		
< 25	38	13.9
25 - 29.9	79	28.8
>= 30	156	57.3

Note. $n = 273$

Baseline Medical Characteristics of the Study Sample

The epidemiological data included the following independent variables: hypertension, diabetes mellitus, high cholesterol, obesity, atrial fibrillation, arthritis, stress, old age, sleep apnea, exercise, smoking, alcohol consumption (four or greater drinks a day), and previous history of stroke/TIA history. The dependent variables were previous stroke/TIA and source of stroke information (medical practitioner). The descriptive statistics for the study sample variables are presented in Table 4.

Table 4.

Descriptive Statistics of the Study Sample Variables From the South District of South Suburban Cook County in the State of Illinois

Variable	Responses	Frequency	Percent
Previous stroke/TIA	Yes	135	49.3
Hypertension	Yes	191	69.7
Obesity	Yes	172	62.8
Atrial fibrillation	Yes	77	28.1
Perception (Fated stroke)	Yes	150	54.7
Perception (Fated stroke)	No	53	19.3
Diabetes	Yes	57	20.1
Smoking	Yes	177	64.6
Exercise	Yes	154	56.2
Stress	Yes	172	62.8
Sleep apnea	Yes	88	32.1
Arthritis	Yes	54	19.7
HA Family History	Yes	140	51.1
Old age	Yes	138	50.4
Four or greater drinks/day	Yes	140	51.1
High Cholesterol	Yes	84	30.7
Source of stroke information (Medical Practitioner)	Yes	58	21.2

Note. N = 273

Results

The results are divided into two sections, arranged according to research question.

Research Question 1

RQ1: Is there any significant association between knowledge of the stroke risk factors and perception of stroke risk factor (that some people are fated to have a stroke, so nothing can be done to prevent it) in the adult African American population of South District Cook County?

I conducted multiple regression analysis to predict positive perception (some are not fated to have stroke) from variables of high cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, stress, atrial fibrillation, Headache, family history, four or greater drinks per day, obesity, lack of exercise, and previous stroke or TIA. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. In other words, the results show that the statistical analysis met the assumptions of the test used: multiple linear regression. Linearity means that the relationship between predictor variables (independent variables) and the outcome variables (dependent variables) are assumed to be linear.

The multiple regression model statistically significantly predicted some are not fated to have stroke, F (14, 259) = 6.644, $p < .0005$, adj. $R^2 = .224$. Only two variables, previous stroke/TIA (p-value = 0.021) and diabetes mellitus (p-value < 0.001) added statistical significance to the prediction, p-value less than or equal to 0.05. This study rejected the null hypotheses; it did show an association between knowledge of stroke risk factors and two strong risk factors for stroke diabetes mellitus and previous stroke/TIA. Regression coefficients, standard errors, and statistical significance (sig) can be found in Table 5. The results of this analysis are summarized in Table 5:

Table 5

Summary of Multiple Regression Analysis of Knowledge of the Stroke Risk Factors

Variables	B	SE	B	Sig (p-value)
Intercept	0.310	0.081		0.000
Previous stroke/TIA	-0.062	0.027	-0.228	0.021
Hypertension	-0.010	0.021	0.034	0.621
Diabetes	0.103	0.014	0.423	0.000
Smoking	0.006	0.024	0.021	0.801
Lack of Exercise	0.035	0.025	0.122	0.162
Obesity	0.004	0.024	0.015	0.815
Sleep apnea	0.016	0.023	0.055	0.499
Atrial fibrillation	-0.017	0.024	-0.058	0.470
Stress	-0.003	0.023	-0.009	0.913
Arthritis	0.005	0.024	0.013	0.849
HA family history	0.012	0.023	0.045	0.597
Old age	-0.018	0.021	-0.064	0.393
Four or greater drinks	-0.023	0.023	-0.087	0.311
High cholesterol	-0.050	0.027	-0.104	0.066

Note. N = 273.

a. Dependent variable: fated stroke-no

Assumptions. There are several assumptions associated with multiple linear regression. These include normality, linearity, among others. In my analyses these were confirmed. Below, I have provided information to confirm that the normality assumption was met by generating the histogram and the Normal P-P Plots of regression standardized residual. Figure 4 shows the histogram of normal distribution for fated stroke.

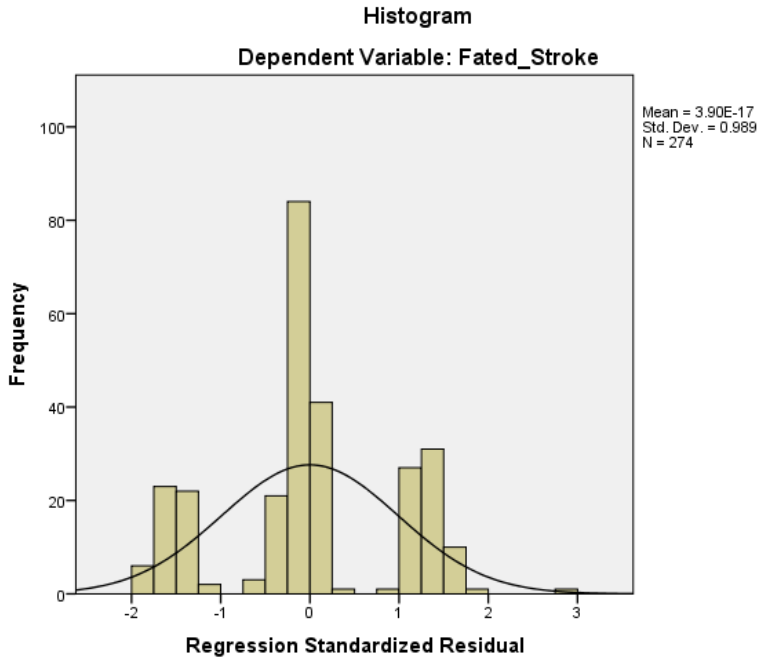

Figure 4. Histogram for fated stroke.

In Figure 4, it is observed that the mean, standard deviation and number of cases (i.e., participants) are shown in the top-right of the histogram. The mean and standard deviation should have values of approximately 0 (zero) and 1, respectively.

To confirm my opinion of normality based on the visual inspection of the above histogram, I also looked at the Normal P-P Plots that was produced. Figure 5 shows the Normal P-P Plot for fated stroke.

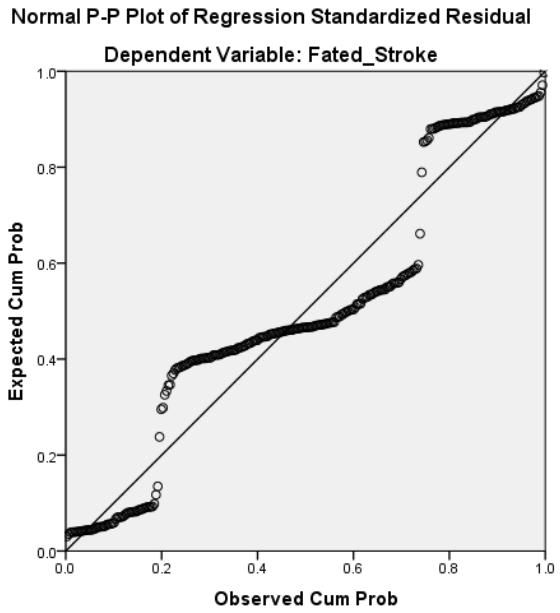

Figure 5. The Normal P-P Plot for fated stroke.

Normal probability plots (Normal P-P Plots) such as in Figure 5 are designed to assess normality and are one of the best graphical methods of doing so. If the residuals are normally distributed, the points will be aligned along the diagonal line. In reality, the points will never be perfectly aligned along the diagonal line. The residuals need to be approximately normally distributed as the regression analysis is fairly robust to deviations from normality. I observed from the above Normal P-P Plot that despite the points are not aligned perfectly along the diagonal line, they are close enough to indicate that the residuals are approximately normally distributed. As linear regression analysis is fairly robust against deviations from normality, this result can be accepted as meaning that no transformations or otherwise need to take place; I have not violated the assumption of normality. Finally, based on the above findings, residuals were normally distributed as assessed by visual inspection of a normal probability plot.

The statistical significance of the overall model (i.e., the model containing high cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, stress, atrial fibrillation, HA family history, four or greater drinks, obesity, exercise, and previous stroke or TIA) is presented in the "**Sig.**" column of the **ANOVA** Table 6 below:

Table 6

Multiple Regression: Analysis of Variance (ANOVA[a]) of knowledge of the stroke risk factors

Model	Sum of Squares	df	Mean Square	F	Sig (p-value)
Regression	11.296	14	0.807	6.644	0.000[b]
Residual	31.452	259	0.121		
Total	42.748	273			

Note. *n* = 273.
a. Dependent Variable: Fated stroke -No
b. Predictors: (Constant/intercept), High cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, Stress, atrial fibrillation, HA family history, four or greater drinks, obesity, exercise, previous stroke/TIA

I conducted multiple linear regression analysis to predict "Perception of stroke: Fated Stroke-Yes" (some are fated to have stroke) and knowledge of the stroke risk factors: high cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, Stress, atrial fibrillation, HA, family history, four or greater drinks per day, obesity, exercise, and previous stroke/TIA. The multiple regression model statistically significantly predicted some are fated to have stroke, F (14, 259) = 22.692, $p < 0.0005$,

adj. R^2 = 0.527. Six (6) variables (previous stroke or TIA (*p*-value = 0.049), knowledge of hypertension (p-value = 0.000), diabetes (p-value = 0.000), atrial fibrillation (p-value = 0.05), arthritis (p – value = 0.000), and four or greater drinks per day (p-value = 0.007)) added statistically significance to the prediction, p-value less than or equal to 0.05. Regression coefficients, standard errors, and statistical significance (sig) can be found in Table 7. The results of this analysis are summarized in Table 7.

Table 7

Summary of Multiple Regression Analysis of Knowledge of the Stroke Risk Factors

Variables	B	SE	B	Sig (p-value)
Intercept	0.215	0.080		0.008
Previous stroke/TIA	0.052	0.026	0.152	0.049
Hypertension	-0.103	0.020	0.271	0.000
Diabetes	0.195	0.013	0.634	0.000
Smoking	-0.011	0.024	-0.031	0.639
Lack of Exercise	-0.012	0.024	-0.034	0.614
Obesity	0.025	0.023	0.071	0.284
Sleep apnea	-0.009	0.023	-0.026	0.683
Atrial fibrillation	-0.046	0.024	-0.124	0.05
Stress	-0.003	0.023	-0.009	0.913
Arthritis	0.083	0.023	0.196	0.000
HA family history	0.000	0.023	-0.001	0.989
Old age	-0.030	0.020	-0.085	0.149
Four or greater drinks/day	0.062	0.023	0.087	0.007
High cholesterol	0.015	0.027	0.024	0.585

Note. $n = 273$.

a. Dependent variable: Perception: fated stroke-Yes

The statistical significance of the overall model (i.e., the model containing high cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, stress, atrial

fibrillation, HA, family history, four or greater drinks, obesity, exercise, and previous stroke/TIA) is presented in the "**Sig.**" column of the **ANOVA** Table 8 below.

Table 8

Analysis of Variance (ANOVA[a]) of Knowledge of the Stroke Risk Factors

Model	Sum of Squares	df	Mean Square	F	Sig (p-value)
Regression	37.396	14	2.671	22.692	0.000[b]
Residual	30.487	259	0.118		
Total	67.883	273			

Note. n = 273.

a. Dependent Variable: Fated stroke –Yes

Predictors: (Constant/intercept), High cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, Stress, atrial fibrillation, HA family history, four or greater drinks, obesity, exercise, previous stroke/TIA.

Apparently, the regression model is statistically significant, $F(14, 259) = 22.692$, $p < .0001$. It is statistically significant because $p < .05$. A statistically significant result also indicates that there is a statistically significant linear relationship. This is reported from the table above as: $F(14, 259) = 22.692$, $p < .0001$. I found that the adjusted R^2 of the model is .527 with the $R^2 = .551$. This means that the linear regression explains 52.7% of the variance in the data.

Table 9

Model Summary of knowledge of the stroke risk factors

Model	R	R Square	Adjusted R Square	Std. Error of the Est.	DurbinWatson
1	.742	.551	.527	34309	.886

Note. n = 273.
Dependent Variable: Fated stroke -Yes
Predictors: (Constant/intercept), High cholesterol, diabetes, smoking, arthritis, hypertension, sleep apnea, old age, Stress, atrial fibrillation, HA family history, four or greater drinks, obesity, exercise, previous stroke/TIA

Research Question 2

RQ2: Is there any significant association between source of stroke information (medical practitioners) and previous stroke/TIA in the adult African American population of south district Cook County?

A *Chi*-squared test for association was conducted between source of stroke information (medical practitioners) and previous stroke/TIA. All expected cell frequencies were ascertained. Based on the results, I can state that there was a statistically significant association between source of stroke information (medical practitioners) and previous stroke/TIA, χ^2 (1) = 29.133, p = 0.001. Since the p-value (0.001) is less than my chosen significance level alpha = 0.05, I can reject the null hypothesis, and conclude that there is an association between source of stroke information (medical practitioners) and previous stroke/TIA in the adult African American population of south district Cook County. The results of this analysis are summarized in Table 10

Table 10

Chi-Square Tests of source of stroke information (medical practitioners) and previous stroke/TIA

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.133	9	0.001
Likelihood Ratio	31.539	9	0.000
Linear-by-Linear	15.405	1	0.000
Number of Valid Cases	273		

Note. n = 273.

Table 11

Symmetry Measures of Sources of Stroke Information (Medical Practitioners) and Previous Stroke/TIA

	Values	Approx. sig.
Nominal by Nominal Phi	0.248	0.001
Cramer's V	0.164	0.001
Number of Valid Cases	273	

Note. n = 273.

Phi and Cramer's V are both tests of the strength of association. The above result of source of stroke information (medical practitioners) and previous stroke/TIA demonstrated that the strength of association between the variables is strong.

The clustered bar chart below (figure 1) presents the representation of data showing clearly the differences in preference for source of stroke information (medical practitioners) and previous stroke/TIA

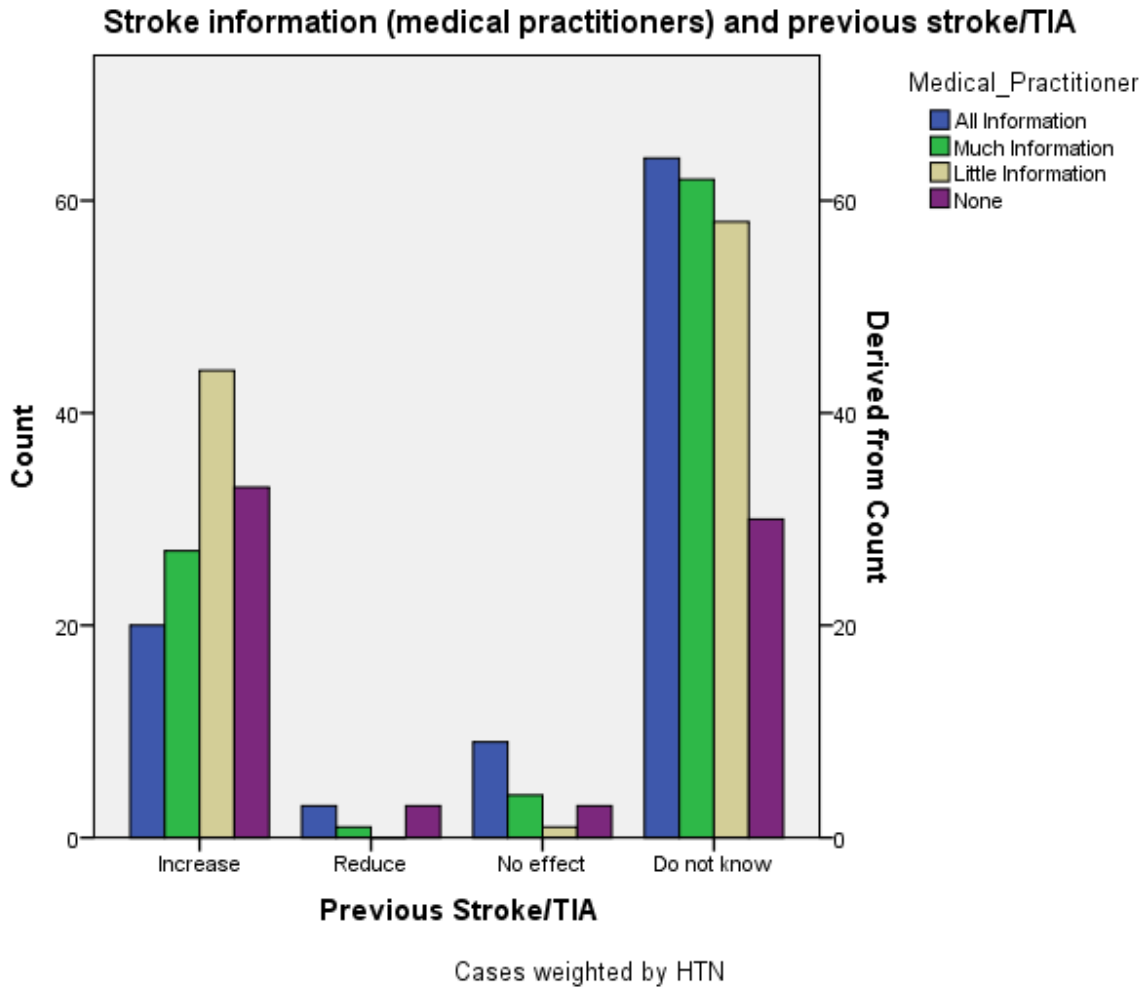

Figure 6. Clustered Bar chart for stroke information (medical practitioners) and previous stroke/TIA.

Summary

The statistical analysis of the study data supported hypothesis 1 and 2 thus rejecting the null hypotheses. In the first research question, the study sought to answer if there is a significant association between knowledge of stroke risk factors and perception fated to have stroke). Two of the variables reached statistical significance previous stroke and diabetes mellitus *p*. = 0.021 and *p*. = 0.000 respectively. However, when the same variables and perception (fated to have stroke so nothing can be done to prevent it) was used for the participants that answered yes nothing can be done, many of the variables showed statistical significance: Previous stroke/TIA *p*. = 0.049, Hypertension p. = 0.000, diabetes mellitus p. = 0.000, atrial fibrillation *p*. = 0.05, four or more alcoholic drinks daily *p*. = 0.007.

The second research question of is there a significant association between sources of information (medical practitioners) and previous stroke in the adult African American population of South District Cook County Illinois, the data showed a strong statistical significance between the two.

In Chapter 5 I summarize the study and provide conclusions about the findings. I also discuss the social implications of these findings, the limitations of the study, and future recommendations for continued research in this area.

Chapter 5

Introduction

This study was carried out to determine the association between the knowledge of stroke risk factors—high blood pressure, diabetes mellitus, high cholesterol, atrial fibrillation, sleep apnea, over weight/obesity, smoking, and excessive alcohol consumption—and perception of stroke in adult African Americans of South District Cook County Illinois. Also, I examined the association between knowledge of stroke risk factors and sources of stroke information in this population. The results of the current study support positive social change aimed at broadening the community educational programs targeted specifically towards African Americans on the risk factors for stroke. Understanding behaviors that positively influence health through the reduction of stroke risk factors is important. According to Gibson and Mistri (2012), there is poor implementation of stroke prevention strategies despite evidence of effectiveness of primary prevention and risk factor management. Seventy-five percent of all strokes are first time, and 80% of strokes are preventable (Goldstein et al., (2011). Though there have been tremendous advances in treatment of acute stroke, primary prevention of stroke remains the best approach in reducing both the incidence and burden of stroke (Meschia et al., 2014). The results from this study showed that less than a quarter of the respondents had health information provided by their healthcare provider.

The current study demonstrated that there is a significant relationship between knowledge of stroke risk factors and perception of stroke and between knowledge of stroke risk factors and sources of stroke information. Findings from the study suggest that

African American adults in South District Cook County Illinois perceive stroke as what happens and nothing can be done to prevent it. For this population, this perception could be the driving force behind them not modifying their risk factors for stroke.

Stroke continues to be at the fifth leading cause of death and the leading cause of long-term disability with African Americans bearing the brunt of this devastating ailment. Stroke costs tax payers over $36.5 billion annually *(*Go et al., 2014). Ischemic stroke, which accounts for 87% of strokes, can be prevented by modifying certain risk factors that are predominant among African Americans including hypertension, diabetes mellitus, hyperlipidemia, overweight and obesity, smoking, consuming more than four drinks daily and physical inactivity (Go et al., 2014).

Summary and Interpretation of Findings

In this study I explored the relationship between the knowledge of the risk factors for stroke and the perception of stroke and the relationship between knowledge of stroke risk factors and the source of stroke information in the African American population of the South District of South Suburban Cook County in the State of Illinois. The results from the study show that a majority of respondents were female (58%) and single (52.2%) and had a BMI ≥ 30 (57.3%). Income level was below the poverty level of < $25,000 annual household income for a family of four. The proportion of smokers in this population is eight times higher (64.6%) than the general U.S. population: (18.2%) in 2012 (Healthy People 2020, 2014). Similarly, alcohol consumption is higher in this population (51.1%) when compared with the national population (17.4%) in 2012 (Healthy People 2020, 2014). Also, lack of exercise in this population is 56.2% as

compared to 20.6% nationally (Healthy People 2020, 2014). The results show that 49.3% of respondents have had previous stroke or TIA, 70.0% had hypertension, and 63.0% had diabetes mellitus, which are all important traditional stroke risk factors. However, it is disturbing that 55% of the respondents perceived that there is nothing that can be done to stop a stroke as some people are fated to have a stroke irrespective of medical treatment or intervention.

The results from the study showed that only 21.2% of the patients received stroke related education from healthcare providers. This becomes of importance because there is an association between knowledge of stroke risk factors, previous stroke/TIA, and source of stroke information ($p = 0.001$). This mirrored other studies using the same variables where healthcare providers were not identified as the primary source of education on stroke risk factors, which is of concern (Wong et al., 2012). In a study by Wong et al. (2012), only 14% of the respondents were exposed to stroke related information by healthcare professionals. For someone to influence or change people's behaviors or personal risk factors, they must understand what those risk factors are (Bogoshi et al., 2003). Perceived risk for stroke can only be accurate if individuals understand their personal risk factors. Knowledge and risk perception should be considered specifically for African Americans as the results can be used to develop effective programs to reduce the risk of stroke in this population. The results of the study show a disconnect between the participants' stroke risk factors and their 10-year stroke risk perception. Seventy-five percent of the respondents who answered average to very unlikely on their knowledge of 10-year risk of stroke do not perceive themselves at risk for a stroke in the next 10 years

despite the prevalence of multiple stroke risk factors. Boden-Albala et al., (2011) in their study identified that only 20% of their study population accurately estimate their stroke risk.

Table 11 summarizes the Reported Medical Conditions per respondent (see appendix

For this study, stroke risk perception is the belief knowledge or awareness by an individual that they will have a stroke which may be soon or later based on their knowledge or no knowledge of their personal risk factors for stroke. It is assumed that the knowledge of the risk factor for an ailment will provoke a desire for the individual to manage their risks in order to prevent the event from occurring (Boden-Albala et al., 2011; Eshah, 2013). Accurate risk perception is valuable in both primary and secondary prevention of stroke. Management of risk factors for stroke have been researched and found to reduce the incidence of stroke, but despite ongoing efforts to create awareness for stroke and encourage people to manage their personal risk factors, individuals at highest risk for stroke still do not perceive themselves at risk (Yang et al., 2013). These dissertation study results are in contrast to the study by Boden-Albala et al., (2011) who noted that in a population with prior stroke, only 20% accurately estimated their risk for recurrent stroke, while 10% underestimated and 70% overestimated their risk. In this study, respondents underestimated their risk for stroke. Contrary to previous studies, this study found that 40% estimated their 10-year risk for stroke as average while 24% estimated their 10-year risk as unlikely. This is concerning for a population where 83.2% reported three or more medical conditions related to stroke.

The perceived stroke risk in the study by Wang et al., (2012) was low, ranging from 37% to 46%, whereas perceived high risk was 6% to 11%. Yang et al.'s (2013) population study among community residents in China the perceived risk for stroke was only 18% even though stroke awareness was rated between 53% and 87%. As the number of stroke risk factors increased, the perceived risk for stroke in this population also increased in the age range of 45-64 years. In those with one stroke risk factor, the perceived risk factor was 16.5%; for those with two risk factors the perceived risk was 38%; and the perceived risk was 41% among those with three or more stroke risk factors (Yang et al., 2013). The perceived risk for stroke was higher in participants who were 45-64 years than those who were 65 years and older at 21% and 10% ($p = 0.019$). The educational level of those 45 years to 64 years was also higher than those 65 years and older (Yang et al., 2013). In contrast, the present study found that the perceived risk for stroke was higher in age group 55-64 at 33% followed by ages 45-54 at 23%. Also, the educational level of the age group 55-64 years was higher than 45-54 years at 25% and 17% respectively.

Limitations and Future Recommendations

Limitations of the Study

Even though this study utilized a large sample size and as such is robust to most errors and biases related to inadequate sample size, there are a few of limitations that are worth summarizing. One of such limitation is that this study exclusively focused on African Americans in South District Cook County in Illinois which is the population of interest. While this is not traditionally a limitation in itself, it means that conclusions

from this study can only be generalized to African Americans within this location and may not be representative of African Americans in other locations and also might not be applicable to other racial/ethnic groups.

A second limitation of this study was the use of volunteer respondents and not randomly selected. As a result, the sample may not be representative of African Americans elsewhere in Cook County or State of Illinois or the Unites States at large. Also, the questionnaires were self-reported answers which could mean that data were less reliable than if they had been subjected to additional, more objective answers. A third limitation was lack of gender difference analysis of variables in the study. Strength of this study was the sample: a cross-section of adult African Americans in South District Cook County Illinois representing an area where stroke is prevalent. Another strength is the variability of the age groups which ranged from young adult 18 and older and no such study has included participants that young especially African Americans, who are often not easy to enroll in research studies.

- Information biases: In health conditions and risk factors information study such as this that is done by a cross sectional survey, respondents' self-reported responses could include a tendency of giving socially acceptable answers rather the facts on objectionable behaviors and abhorred health conditions. Selection bias: Respondent's selection was not random and, so it may not completely be a representation of this population. Also, potential researcher bias in particular participant selection of mostly elderly patients in the clinics.

- Reporting bias: This condition that focuses on selective revealing and or suppression of information relevant to the study by the respondent or the researcher is also a cause of concern and, researcher associated outcome biases. (Higgins and Green, 2011).
- Measurement bias and error: For this study, the SRFKPQ questionnaire fit the design and purpose of the study. Also, true values of results were reported without favoring a particular result.

Implications for Social Change and Recommendations for Action

This study will contribute to the body of knowledge by influencing targeted educational interventions related to knowledge of stroke and its risk factors in this population. Also, it may direct practice, influence policies and reduce health cost by reduced stroke incidence. This is an important study as it did address and illuminate an understudied area in primary prevention of stroke in a population that has documented high rates of stroke and poorer outcomes than other ethnic compositions (Alkadry et al., 2011). Numerous studies have found African Americans to have negative outcomes from stroke (Go et al., 2013). The results of this study provided an insight into not only the knowledge base of this population regarding risk factors for stroke, but also their attitude towards stroke factors reduction and the perceived risk of stroke for those with and without known risk factors. Furthermore, the results from this study will guide stroke prevention by providing tailored or targeted education towards risk reduction for this population.

Identification of the most important risk factors that drive the increased stroke occurrence will aid in targeted primary prevention thus reducing the incidence of stroke in this population. Primary stroke prevention is essential for the African American population because they experience stroke at a younger age with more negative outcomes (Alkhadry, Bhandari, & Blessett, 2011). The findings will lead to greater awareness and implementation of stroke risk factor preventive measures in the African American individual, communities, healthcare providers and possibly lead to policy changes (Pearson, 2011) that will focus on specific risk factor reduction for such populations not just in South District Cook County but possibly nationally and internationally as well.

The study findings highlighted the importance of stroke education of patients from healthcare providers. This is especially important considering that most of the surveyed population came from patients visiting the clinics for follow up with their primary care providers. Judging from the fact that 70% of the respondents have high blood pressure which is the most important risk factor, all patients visiting the clinics should be educated by their primary care providers on stroke including risk factors, warning signs, the importance of medication adherence, physician follow up and activating the emergency medical system if experiencing any of the warning signs of stroke. Also, every clinic should have a lifestyle center where patient's questions can be addressed professionally and also referred to for nutritional counselling. Planned community activities in community centers with different weekly topics on addressing some health issues would also be of benefit to these communities. Faith-based activities involving the religious groups in these communities are also good to consider. All these

are geared towards saturating the communities with educational materials. Perceived risk for stroke can only be accurate if the individual understands their personal risk factor. Knowledge and risk perception should be considered exclusively for African Americans as the results can be used to develop effective programs to reduce the risk of stroke in this population. This recommendation for stroke education to all African Americans in every encounter with the system is based on the fact that majority of the respondents have multiple risk factors for stroke. Thirteen (13) respondents have 1 risk factor (4.8%), 34 respondents (12.1%) have 2 risk factors, 50 respondents (18.4%) showed presence of 3 risk factors; 69 respondents (25.4%) reported 4 risk factors; 88 respondents (32.4%) reported 5 risk factors and 19 respondents (7%) reported 6 risk factors.

This study also shows that addressing the traditional stroke risk factors is not enough in stroke prevention education. Patient's belief or perception must be probed or explored to find out the underlying beliefs for not following health education recommendations. Also, this study shows that there is not enough stroke prevention education in healthcare. Primary care providers should endeavor to provide education to reduce the burden of stroke. Still, results obtained from the current study could be used to develop culturally sensitive interventions among African Americans.

Table 12 summarizes the Reported Medical Conditions Per Respondent

Recommendations for Further Study

This was a small study population consisting of 273 participants. The results may not be a complete reflection of the generalized population introducing reporting bias. Based on the results of this study, several recommendations can be made for further

study: A wider geographical scope is needed because this study was limited to predominantly African American adults in South District Cook County and from two clinics, two churches, one barber shop and one beauty shop. Study that uses a purposeful, instead of a convenience sample could yield other results.

A qualitative research study will be of great importance for a more robust exploration of the perceived risk for stroke phenomenon among this population. Also, socio economic status, perception and educational level should be more studied to explore the relationship between them.

Conclusion

Stroke affects all racial and cultural groups in the United States, but it is especially prevalent among African Americans because of the increased risk factors associated with stroke in this population. In South District Cook County Illinois where this study took place, stroke is the leading causes of death among African Americans, who are at increased risk for heart disease and cardiovascular events, hospitalizations and death. Public health interventions to reduce stroke among African Americans are both a moral and financial imperative. Everyone in the United Sates deserves an equal opportunity for a healthy life. In addition, reducing unnecessary hospitalization and emergency room costs will result in redirecting those resources to other areas that can improve people's quality of life and contribute to greater economic stability. The Healthy People 2020 initiative targeted medical conditions but more also the social determinants of health. The five key areas include economic stability, education, social, and community context, health and healthcare and neighborhood and the built environment.

To achieve optimal health outcomes, these factors must be considered and addressed (HP 2020). Effective stroke education of patients by healthcare practitioners in primary care remains the key to reduced incidence of stroke and removal of negative health beliefs.

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Appendix A: Permission to Use the Stroke Awareness Questionnaire

28TH July 2015.

Dear Adaku, Ngozika Madubuko,

You are very welcome to us the Stroke Awareness Questionnaire, which I attach hereto.

We would be delighted to receive any papers or abstracts that might result from this.

I attach this questionnaire for your use in your dissertation study of stroke risk factor knowledge in African American population of South District Cook County Illinois in the United States.

We wish you all success in your research and dissertation at the Walden University in Minneapolis.

Yours sincerely,

For: Professor Anne Hickey

Mrs. Carole Carolan
Department Secretary & Administrator

RCSI Psychology
Royal College of Surgeons in Ireland
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From: Adaku Madubuko [mailto:amadubuko@yahoo.com]
Sent: 27 July 2015 20:37
To: Carole Carolan
Subject: Permission to use the Stroke Awareness Questionnaire

Appendix B: Permission to Use the Stroke Awareness Questionnaire

July 27, 2015

To Carole Carolan

From Adaku Ngozika Madubuko

Permission to Use the Stroke Awareness Questionnaire

This is to ask for your permission to use and modify as needed the Stroke Awareness Questionnaire to suit my dissertation study of stroke risk factor knowledge in the African American population of South District Cook County Illinois in the United States.

I am an epidemiology doctoral student at Walden University Minneapolis United States of America.

I was referred to you by Dr. Hickey.

Please an official response letter will be preferred.

Thank you in anticipation

Adaku Ngozika Madubuko

-
-
- 1 Attachment

- STROKE AWARENESS QUESTIONNAIRE SAQ

.pdf

Download

Appendix C: Permission to Use the Stroke Knowledge Test Questionnaire

Karen Sullivan

Karen Sulliva137arenren.sullivan@qut.edu.au>
Thank you for your email. I have attached the test to this message. I hope it proves useful for your purposes.

STROKE
KNOWLEDGE TEST su

Best wishes

Karen Sullivan, PhD

From: Uzomba, Adaku [mailto:auzomba@cookcountyhhs.org]
Sent: Tuesday, 19 May 2015 6:41 AM
To: Karen Sullivan
Cc: amadubuko@yahoo.com
Subject: Permission to use Stroke Knowledge Test Questionnaire

Dear Sir,

To Whom It May Concern

This is to ask for permission to use your stroke knowledge test kit. I am a Ph.D. student at Walden University and I am researching on the knowledge of stroke risk factors in African Americans in South Suburban Cook County in Illinois and would like to use the stroke knowledge test for my questionnaire data collection as it relates to risk factor knowledge. Thank you in anticipation.

Your Sincerely,

Adaku N Madubuko (Uzomba)

Appendix D: Permission to Use the Stroke Recognition Questionnaire

Kathleen Ennen

Dear Adaku,

Yes, you have my permission to use the Stroke Recognition Questionnaire (SRQ©) for your PhD dissertation research. Please find attached a copy of the SRQ.

Adaku Madubuko
Aug 13

Dear Adaku,

Yes, you have my permission to use the Stroke Recognition Questionnaire (SRQ©) for your PhD dissertation research. Please find attached a copy of the SRQ.

In addition, you are granted permission to adapt the SRQ© to your specific research project and population target needs.
You may well need to change some of the demographic questions to better fit your population sample.

The **scoring for the SRQ©** is as follows: one point for each correctly identified answer (whether the actual signs/symptoms and risk factors or the distractors for each). Some other students using the SRQ© have adapted the "distractors" to their geographic region. I did this as well – having done the original research and SRQ development and testing in Illinois when I used this here in North Carolina I made a few changes and ran it through a quick but simplified pilot test. You want the distractors to actually be distractors for your study sample.

So, the total possible knowledge score is 40, or 20 for each major scale, or 10 if you are just looking at a participant's ability to identify stroke signs/symptoms or stroke risk factors in the individual scales for each.

I wish you the very best. Please send me a copy of your completed work at my email below … thank you!

Kathleen A. Ennen, PhD, RN, CNE
kennen@ec.rr.com

Show original message

From: Adaku Madubuko <amadubuko@yahoo.com>
Reply-To: Adaku Madubuko <amadubuko@yahoo.com>
Date: Monday, August 10, 2015 at 9:17 AM
To: "Kathleen A. Ennen" <kennen@ec.rr.com>
Subject: Permission to use the Stroke Recognition Questionnaire

Dr. Kennen,

I am writing to ask for a copy, and your permission to use the stroke risk factor questions from your Stroke Recognition Questionnaire-SRQ. I am a PhD epidemiology student at Walden University in Minneapolis Minnesota USA, and I am asking for your permission to modify and use the SRQ as it suits my study. My dissertation is on Stroke Risk Factor Knowledge in Adult African Americans of Southern District Cook County in the State of Illinois. Your prompt response will be highly appreciated.

Thanks, in anticipation,

Adaku Ngozika Madubuko

Appendix E: Stroke Risk Factor Knowledge and Perception Questionnaire

Socio-Demographic Information

(N/B Respondents to please check (✓) where appropriate)

1. Gender ☐male (1) ☐ female (2)
2. Age ---------
3. Marital status ☐ Single (never married) ☐ Divorced ☐ Married ☐ Widow ☐ Widower
4. Race: African American ☐ Born in U.S.A ☐ Not born in U.S.A
5. Height ---------- Weight ----------
6. South District Cook County of Illinois

   City/Village ---------- (any of 32) Zip code----------
7. Level of education

   ☐ Less than high school ☐ High School

   ☐ Some college ☐ College
8. Annual Income

   ☐ Less than $20,000 ☐ $21,000 - $30,000 ☐ $31,000- $40,000

   ☐ $41,000 - $50,000 ☐ $51,000 - $60,000 ☐$61,000 - $70,000

   ☐ More than $70,000

Nos. 9 and 10 Not for Respondents

9. BMI	< 25	25- 29.9	≥ 30			
10. Age group	18-24	25-34	35-44	45-54	55-64	65-75

11. Personal Past and Present Medical History

Medical problems	**Yes**	**No**	**Do not know**
High blood pressure			
Diabetes mellitus			
Depression			
High blood cholesterol			
Heart attack			
Severe headaches			
Chest pain			
Stroke/TIA			
Atrial fibrillation			
Anxiety			
Congestive heart failure			
Sleep apnea			

12. Medication History

Medication	**Yes (1)**	**No (2)**	**Do not know**
High blood pressure			
Diabetes mellitus			
Depression			
High cholesterol			
Atrial fibrillation			
Congestive heart failure			
Anxiety			
Severe headaches			

13. Family Medical History

Medical problems	Yes	No	Do not know
High blood pressure			
Diabetes mellitus			
Depression			
High blood cholesterol			
Heart attack			
Severe headaches			
Chest pain			
Stroke/TIA			
Atrial fibrillation			
Anxiety			
Congestive heart failure			
Sleep apnea			

14. Life Style Factors

Diet:

How often does your meal/snacks include vegetables?

☐ Daily (1) ☐ Weekly (2) ☐ Never (3) ☐ Do not know (4)

Physical Activity:

How often do you get involved in 10- 20-minute physical activity (such as brisk walking, bicycling, house cleaning etc.)?

☐ Never (1) ☐ 1-2 days/week (2) ☐ ≥ 3 days/week (4)

Smoking:

Presently how much smoking do you do?

☐Never (1) ☐ stopped (2) ☐ occasionally (3) ☐ daily (4)

Alcohol:

Presently how much alcoholic beverage do you consume?

☐Never/stopped (1) ☐less than 1 drink/day (2) ☐1-2 drinks/day (3)

☐ 3-4 drinks/day (4) ☐≥ 5 drinks/day (5).

15. Stroke Risk Factor Knowledge

Respondent is to please check (✓) responses to the questions below;

Question: How do you think each of the following influences the risk of having a stroke?

Disease condition	**Increases the risk (1)**	**Reduces the risk (2)**	**No effect on risk (3)**	**Do not know (4)**
Smoking				
Lack of exercise				
High alcohol use >4drinks/day				
Anxiety				
Poor diet				
Older age				
Overweight and obesity				
Seizures				
Family history of heart disease				
High blood pressure				
Arthritis				
Atrial fibrillation				
Diabetes mellitus				
Previous stroke/TIA				
Stress				
Sleep apnea				

16. Perceptions on and Sources of Information on Stroke

Sources of Information. *Please check (✓) in the appropriate box*

Question;

How much of your information on stroke and its risk factors did you get from the following?

Sources of Information	**All**	**Much**	**Little**	**None**
Medical practitioners				
Social media (TV/Radio/internet)				
Family and friends				

17. Perception on Stroke Risk Factors

Respondents please check (✓) your responses in the options column to each of the following health belief comments

Questions/Comments	Agree (1)	Disagree (2)	Not sure (3)
Some people are more likely to have a stroke than others			
One can protect him/herself from having a stroke			
If the physician's advice is followed, one is less likely to have a stroke			
I worry about having a stroke			
Some people are fated to have a stroke, so nothing can be done to prevent it			

18. Based on your knowledge and experience, can you quantify (on a 0 - 5 scale) your supposed 10-year stroke risk?

Rating	Check	Represents/meaning
0	☐	Very unlikely
1	☐	Unlikely
2	☐	Average
3	☐	Marginal/Fair
4	☐	Likely
5	☐	Very likely

Appendix F: South District Cook County Illinois Relevant Based Profile and Statistics

A: **Constituent Communities**

Burnham 60633	Harvey 60426	Phoenix 60426
Calumet City 60409	Hazel Crest 60429	Posen 60469
Chicago Heights 60411	Homewood 60430	Richton Park 60471
Country Club Hills 60478	Lansing 60438	Sauk Trail 60411
Dixmoor 60426	Lynwood 60411	South Chicago Heights 60411
Dolton 60419	Matteson 60433	South Holland 60473
East Hazel Crest 60429	Markham 60428	Steger 60475
Flossmoor 60422	Midlothian 60445	Thornton 60476
Ford Heights 60411	Oak Forest 60452	Tinley Park 60477
Glenwood 60425	Olympia Fields 60461	Riverdale 60827
	Park Forest 60466	Robbins 60472

B. Age Distribution (2010)

18 years to 24 years	213,542	8.5%
25 years to 49 years	833,256	33.3%
50 years to 64 years	499,089	20.0%
65 years to 84 years	288,050	11.5%

C. Gender

Males	1,206,126	48.3%
Females	1,292,671	51.7%

D. Racial and Ethnic Composition

Hispanics	465,896	18.6%
Whites (non-Hispanics)	1,423,635	57.0%
Blacks	400,159	16.0%
Asian/Pacific Islander	176,216	7.1%

Retrieved from Cook County Department of Public Health (2012)

Appendix G: Age Group and 10-Year Risk Factor

Age group and 10yrs Risk factor

Count		Risk_factor_10yrs						Total
		Very unlikely	Unlikely	Average	Fair	Likely	Very likely	
Age_group	18-24yrs	6	4	3	1	0	0	14
	25-34yrs	7	12	8	5	0	1	33
	35-44yrs	8	12	15	2	0	1	38
	45-54yrs	9	19	20	11	3	0	62
	55-64yrs	7	16	48	11	4	3	89
	65-74yrs	4	3	16	5	5	2	35
	75 and Above	0	0	2	0	1	0	3
Total		41	66	112	35	12	7	273

Appendix H: Age Group and Educational Status

Age group and Educational Status

Count		Educational Status				Total
		Less than High sch.	High School	Some College	College	
Age group	18-24yrs	1	6	5	2	14
	25-34yrs	2	9	7	15	33
	35-44yrs	3	12	10	13	38
	45-54yrs	15	17	18	12	62
	55-64yrs	22	28	25	14	89
	65-74yrs	10	9	8	8	35
	75 and Above	0	2	0	0	2
Total		53	84	73	64	273

Appendix I: Knowledge of 10-Year Stroke Risk

	Frequency (n=273)	Percent (%)
Very Unlikely	41	15.0
Unlikely	66	24.1
Average	112	40.9
Fair	35	12.8
Likely	13	4.7
Very likely	7	2.6

Appendix J: Reported Medical Conditions

	Frequency	Percent	Cumulative Percent
1	13	4.8	4.8
2	34	12.1	16.9
3	50	18.4	35.3
4	69	25.4	60.7
5	88	32.4	93.0
6	19	7.0	100.0
Total	273	100.0	

Note. (*N* = 273).